COMPETENCE IN COMMUNICATION

User Manual

netSCADA with atvise builder

Installation, web visualization, operation and hardware description

Hilscher Gesellschaft für Systemautomation mbH
www.hilscher.com

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1 Introduction

1.1 About this document

1.1.1 Description of the contents

This user manual describes installation, web visualization, operation, configuration and the hardware of the Hilscher netSCADA devices **NL 50N-MPI-ATVISE** (netLink SCADA for PROFIBUS MPI) and **NSCD-T52-RS/ATVISE/MBR** (netSCADA for Modbus) with integrated atvise® web visualization. It contains information on commissioning and using the netSCADA devices for visualizing data from a SIMATIC® S7® PLC via PROFIBUS-MPI (**NL 50N-MPI-ATVISE**) and from a Modbus network (**NSCD-T52-RS/ATVISE/MBR**). It describes the process of creating web content for the netSCADA devices with the atvise builder software in order to use the netSCADA as a visualization and operating station.

1.1.2 List of revisions

Index	Date	Revision
1	2012-06-06	Document created
		Description for atvise version 2.1.18
2	2013-06-21	Description updated for atvise version 2.2.3
3	2013-11-11	Description updated for atvise version 2.5
		Section *Reference to hardware, firmware and software* updated
		Section *Contents of the product DVD* updated
		Section *System requirements of the configuration PC* added
		Section *Software installation* updated
4	2014-06-12	New netSCADA device **NSCD-T52-RS/ATVISE/MBR** added
		Document completely revised

Table 1: List of revisions

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1.1.3 Conventions in this manual

Notes, instructions and results of operating steps are marked as follows:

Notes

Important:
<important note you must follow to avoid malfunction>

Note:
<general note>

<note where to find further information>

Instructions

1. Operational step
   ➢ instruction
2. Operational step
   ➢ Instruction

Results

Intermediate result

Final result

For a description of the labeling of **Safety Messages**, see section *Labeling of safety messages* [page 15].

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1.1.4 Reference on hardware, firmware and software

Reference on hardware and firmware

Device	Article name	Part number	Hardware revision	Firmware	Firmware version
netLINK SCADA	NL 50N-MPI-ATVISE	1701.431	1	LN303100.nxf	1.2.x.x
netSCADA Modbus	NSCD-T52-RS/ATVISE/MBR	1880.100	2	T07100R0.nxf	

Table 2: Reference on hardware and firmware

Reference on software

Software	Version
atvise builder	2.5.x
Hilscher Symbolizer	1.0003.x
Hilscher Plugins	2.5.x

Table 3: Reference on software

1.2 Scope of delivery

The following items are included in the delivery of the netSCADA:

- SCADA supporting device for atvise web visualization
- netSCADA Solutions product DVD including atvise builder software, Hilscher software components, firmware, USB driver and documentation

Optional accessories

- Vector graphics library ATVISE ELEMENTS, part number: 1701.432

1.3 Contents of the product DVD

The netSCADA product DVD contains the following software:

- atvise builder
- Hilscher atvise Plugin containing Symbolizer, Hilscher WebMI-Server DLL, Hilscher LAN Scanner and Configuration Tool
- USB drivers for Windows

Folder	Contents
Documentation	Documentation in PDF format Adobe Reader installation program for displaying the PDF documents
Firmware	Loadable firmware for the netSCADA devices
fscommand	Files for displaying the start screen and the installation menus of the product DVD
Setups & Drivers	Installation programs for the delivered software
Supplements & Examples	**Device Recovery**: Tools for recovering the NSCD-T52-RS/ATVISE/MBR device via USB **Example Projects**: STEP 7 example projects to be loaded into a SIMATIC S7 PLC (for NL 50N-MPI-ATVISE device only)
Video-Audio Tutorials	Pod- and screen cast presentations about commissioning netSCADA devices with atvise

Table 4: Directory of the netSCADA product DVD

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1.4 Documentation overview

The subsequent table shows where to find information about commissioning the netSCADA devices.

Media	Contents	Document/file	Path on product DVD
User Manual netSCADA with atvise builder (this document)	Installation, web visualization, operation and hardware description of the netSCADA devices	`netSCADA with atvise builder - Web-Visualization UM xx EN.pdf`	`Documentation\english \1.User Manual`
atvise Release Notes v2.5	Release Notes for version 2.5 of the atvise builder	`release_notes_atvise_v2.5.pdf`	`Documentation\english \2.atvise Web Visualization`
Online help of the atvise builder	Online help/operating instruction manual of the atvise builder **Note**: The online help was created by Certec EDV GmbH	`atvise Web Visualization.html`	`Documentation\english \2.atvise Web Visualization`
		Note: Can be opened directly in atvise after having installed the atvise builder on your configuration PC	
netLINK SCADA Podcast	Audio-visual description of a simple commissioning example for the netLINK SCADA NL 50N-MPI-ATVISE	`netLINK SCADA Podcast x.x - Commissioning Example.flv`	`Video-Audio Tutorials \netLINK SCADA`
netSCADA Modbus Screencast	Visual description of a simple commissioning example for the NSCD-T52-RS/ATVISE/MBR	`netSCADA Modbus Screencast - Quick Start Guide.flv`	`Video-Audio Tutorials \netSCADA Modbus`

Table 5: Dokumentation overview

Note:

The screen/podcasts can be launched in the **Quick Start Video Screencasts** menu of the netSCADA DVD flash start screen. As an alternative, you can also play the FLV files by using any other player that supports Flash videos, like e. g. the VLC Media Player. The `Video-Audio Tutorials` folder on the DVD contains a link to a website, from which you can download the VLC Media Player for free.

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1.5 Internet security considerations

1.5.1 HTTP server security considerations

Authentication method: HTTP digest (user name and password are sent encrypted from client to server).

Any FTP client has full access to the user list and the passwords.

1.5.2 FTP server security considerations

FTP Server

Authentication method: Standard FTP (user name and password are sent unencrypted from client to server).

Recommendations

The best way to protect the device from unauthorized access is to keep it disconnected from the Internet.

If the device must be accessible over the Internet, a secure connection like an encrypted VPN tunnel must be used.

Note:
You MUST NOT allow access to FTP port (21) from the Internet by any means!

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1.6 Legal notes

1.6.1 Copyright

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- in air traffic control systems, air traffic or air traffic communication systems;
- in life support systems;
- in systems in which failures in the software could lead to personal injury or injuries leading to death.

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1.6.5 Export regulations

The delivered product (including the technical data) is subject to export or import laws as well as the associated regulations of different counters, in particular those of Germany and the USA. The software may not be exported to countries where this is prohibited by the United States Export Administration Act and its additional provisions. You are obligated to comply with the regulations at your personal responsibility. We wish to inform you that you may require permission from state authorities to export, re-export or import the product.

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1.6.6 Trademarks

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atvise® is a registered trademark of Certec EDV GmbH, Thomas-Alva-Edisonstrasse 1, A-7000 Eisenstadt, Austria.

Modbus is a registered trademark of Schneider Electric.

PROFIBUS® is a registered trademark of PROFIBUS International, Karlsruhe.

SIMATIC®, STEP®7, S7®, S7-300®, S7-400® and MPI® are registered trademarks of Siemens AG, Berlin and Munich.

Windows XP®, Windows® 7 and Windows® 8 are registered trademarks of Microsoft Corporation.

All other mentioned trademarks are property of their respective legal owners.

1.7 Licenses

A license for the atvise builder (a product of Certec EDV GmbH, Thomas-Alva-Edisonstrasse 1, A-7000 Eisenstadt, Austria www.atvise.com) belongs to the netSCADA device in order to be used in conjunction with the device.

An automatic license download is performed during the installation of the atvise builder. The installation program uses web services of the site www.atvise.com. Prerequisite for this is a working access to the Internet. If the license download fails, then the license for the PC can be requested afterwards from Certec by using the atvise project console and using a created account.

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2 Safety

2.1 General safety notes

The user manual, accompanying texts and the documentation were created for the use of the products by qualified experts. When using the products, all safety notes and applicable regulations must be observed. Technical knowledge is required. The user must comply with legal provisions.

2.2 Intended use

The netSCADA devices may only be used as a part of a communication system as described in this manual. The **NL 50N-MPI-ATVISE** device (netLINK SCADA for PROFIBUS MPI) has been designed exclusively for use in connection with the SIMATIC S7-300 and S7-400 PLCs manufactured by Siemens AG.

The devices may not be opened or used without the housing.

2.3 Personnel qualification

The netSCADA device is used as a part of a system which must fulfill safety and accident precaution regulations depending on the respective conditions of use. The user of the system is exclusively responsible for the fulfillment of those regulations.

Therefore the system to which the netSCADA device belongs may only be used by personnel who has been informed and educated about all relevant regulations.

Professional qualification in the following specific areas of electrical engineering is required:

- Security and protection of health at work
- Mounting and attaching of electrical equipment
- Measurement and analysis of electrical functions and systems
- Evaluation of the security of electrical equipment

2.4 References safety

References Safety:

[1] ANSI Z535.6-2006 American National Standard for Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials

[2] EN 61340-5-1 and EN 61340-5-2 as well as IEC 61340-5-1 and IEC 61340-5-2

2.5 Property damage messages

To avoid property damage, respectively device destruction of the netSCADA device or damage to your system, you necessarily must read, understand and follow the following and all other property damage messages in this manual.

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2.5.1 Supply voltage

NOTICE

Device destruction by exceeding allowed supply voltage!

The voltage must not exceed 30 V, otherwise the device may be destroyed or damaged.

2.5.2 Electrostatic discharge

Observe the safety precautions for components that are vulnerable with electrostatic discharge.

NOTICE

Electrostatically sensitive device

This equipment is sensitive to electrostatic discharge, which causes internal damage and affects normal operation. Follow these guidelines when you handle this equipment:

- Touch a grounded object to discharge potential static.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- When not in use, store the equipment in appropriate static-safe packaging.

Reference safety [2]

2.5.3 Potential free external power supply

NOTICE

Device damage of NL 50N-MPI-ATVISE!

When using an external supply voltage, the reference potential of this external supply voltage is galvanically coupled to that of the PROFIBUS. This requires **mandatorily** the power supply to be **potential-free**.

2.5.4 Possible device damage by compensating current at Modbus RTU interface (NSCD-T52-RS/ATVISE/MBR)

NOTICE

Device damage of NSCD-T52-RS/ATVISE/MBR by compensating current

The reference potential of the power supply and the reference potential of the RS-232/RS-422/RS-485 interface of the NSCD-T52-RS/ATVISE/MBR device are galvanically connected.

Avoid compensating currents between the reference potentials of the devices connected via RS-232/RS-422/RS-485.

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2.6 Labeling of safety messages

In this document, the safety instructions and property damage messages are designed according both to the internationally used safety conventions as well as to the ANSI standard.

- The **Section Safety Messages** at the beginning of a chapter are pinpointed particularly. They are highlighted by a specific safety symbol and a signal word according to the degree of endangerment. In the safety message, the nature of the hazard is indicated.
- The **Integrated Safety Messages** embedded in operating instructions are highlighted by a signal word according to the degree of endangerment and possibly by a safety symbol. In the safety message, the nature of the hazard is indicated.

Safety symbol	Safety symbol USA	Sort of warning or principle
		Warning of lethal electrical shock
		Warning of damages by electrostatic discharge
		Principle: Disconnect the power plug

Table 6: Safety Symbols and Sort of Warning or Principle

Signal word	Meaning	Meaning USA
DANGER	Indicates a direct hazard with high risk, which will have as consequence death or grievous bodily harm if it is not avoided.	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a possible hazard with medium risk, which will have as consequence death or (grievous) bodily harm if it is not avoided.	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a minor hazard with medium risk, which could have as consequence personal injury, if it is not avoided.	Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.
NOTICE	Indicates a property damage message.	Indicates a property damage message.

Table 7: Signal Words

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3 Description

The netSCADA devices described in this manual are Ethernet gateways with an integrated HTTP server (servX WebServer) for visualizing fieldbus data (PROFIBUS MPI or Modbus) with **atvise**. The Visualization of the fieldbus data and also the operation and configuration of the device can be done with any standard web browser via the 10/100 MBit/s Ethernet interface of the device.

Manufacturer of the atvise visualization software is CERTEC EDV GmbH (www.atvise.com). The visualization software is integrated into Hilscher netSCADA devices as an embedded solution.

The **atvise builder** software, which is contained in the scope of delivery, can be used to build a relation between the process data that is to be visualized and the visualization contents (such as HTML pages, graphics, links, animations), and also to generate the visualization project. After loading the project into the netSCADA device, it will be stored there power fail-safe in a non-volatile memory.

The netSCADA devices are equipped with a trend recording functionality and an SNTP client for real-time synchronization of the system time with any external SNTP server.

In order to keep the data load in the PROFIBUS MPI respectively Modbus network low, the netSCADA device requests the signals-to-be-visualized from the fieldbus participants only at the very same moment when the visualization pages in the device are being accessed by a web browser. However, in case a trend recording has been configured for certain signals, the device requests the state of the concerned signals (in order to be able to record them) also at times when the corresponding visualization pages are currently not being displayed/accessed by the web browser, i. e. when no visualization access is taking place.

There are two types of netSCADA devices currently available:

- **NL 50N-MPI-ATVISE** for PROFIBUS MPI (because of its compact, plug-like housing also called **netLINK SCADA**)
- **NSCD-T52-RS/ATVISE/MBR** for Modbus (also called netSCADA Modbus) for top hat rail mounting.

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netLINK SCADA NL 50N-MPI-ATVISE

Due to its compact D-Sub-like housing, the **netLINK SCADA NL 50N-MPI-ATVISE** can be fitted directly onto the bus connector of a PROFIBUS-MPI capable SIMATIC S7 component. Via Ethernet cable, it is connected to the nearest switch or hub. The visualization project, which has beforehand been created and downloaded to the device by the atvise builder and is now running in the device, can be accessed via this Ethernet connection by an ordinary web browser on a PC or a notebook.

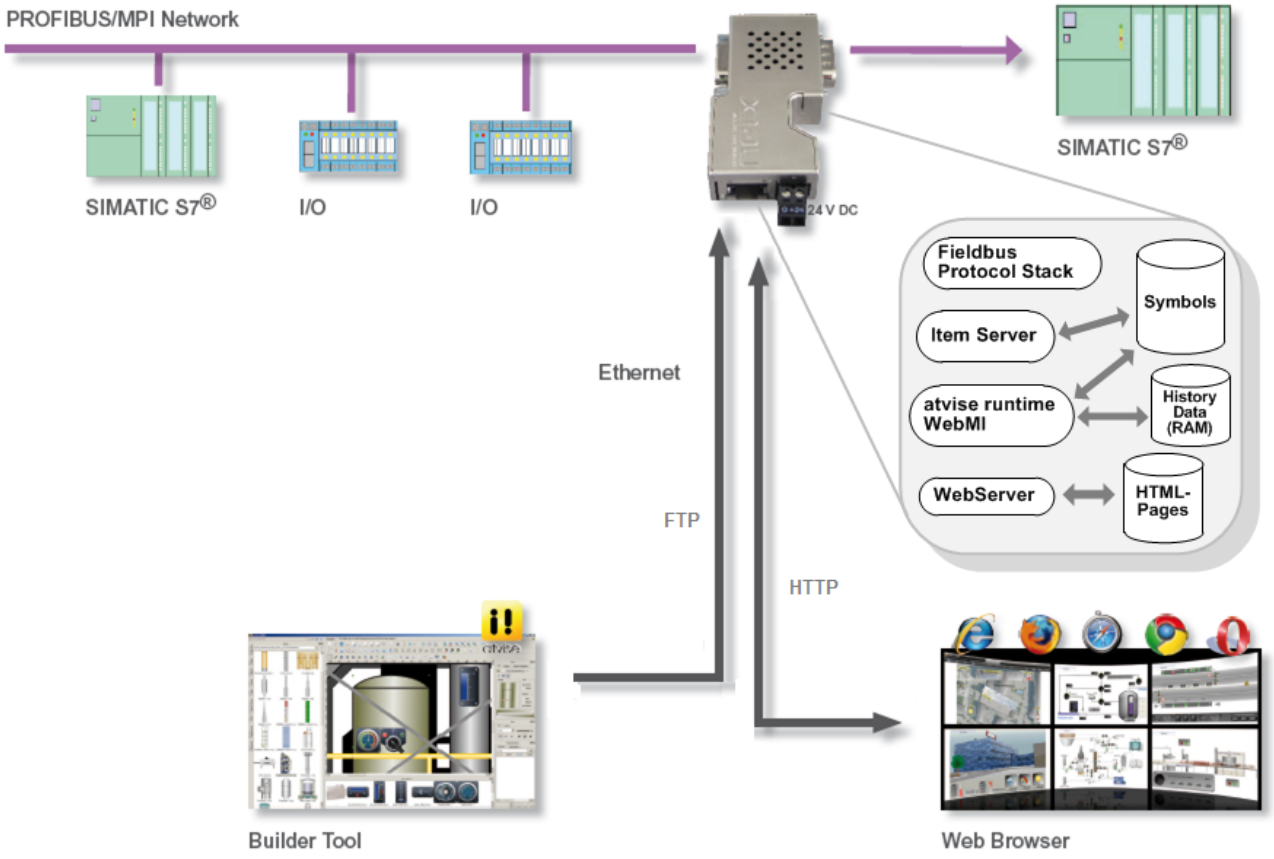

Figure 1: Overview data flow of netLINK SCADA NL 50N-MPI-ATVISE

The power can be supplied directly via the D-Sub interface of the device (if supported by the SIMATIC S7 component), or alternatively externally with a voltage of 24 V via the COMBICON plug.

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netSCADA NSCD-T52-RS/ATVISE/MBR

The netSCADA for Modbus is to be mounted onto a top hat rail according to the DIN EN 60715 standard. It requires an external voltage supply of 24 V (via COMICON plug). The data lines are galvanically isolated from the voltage supply.

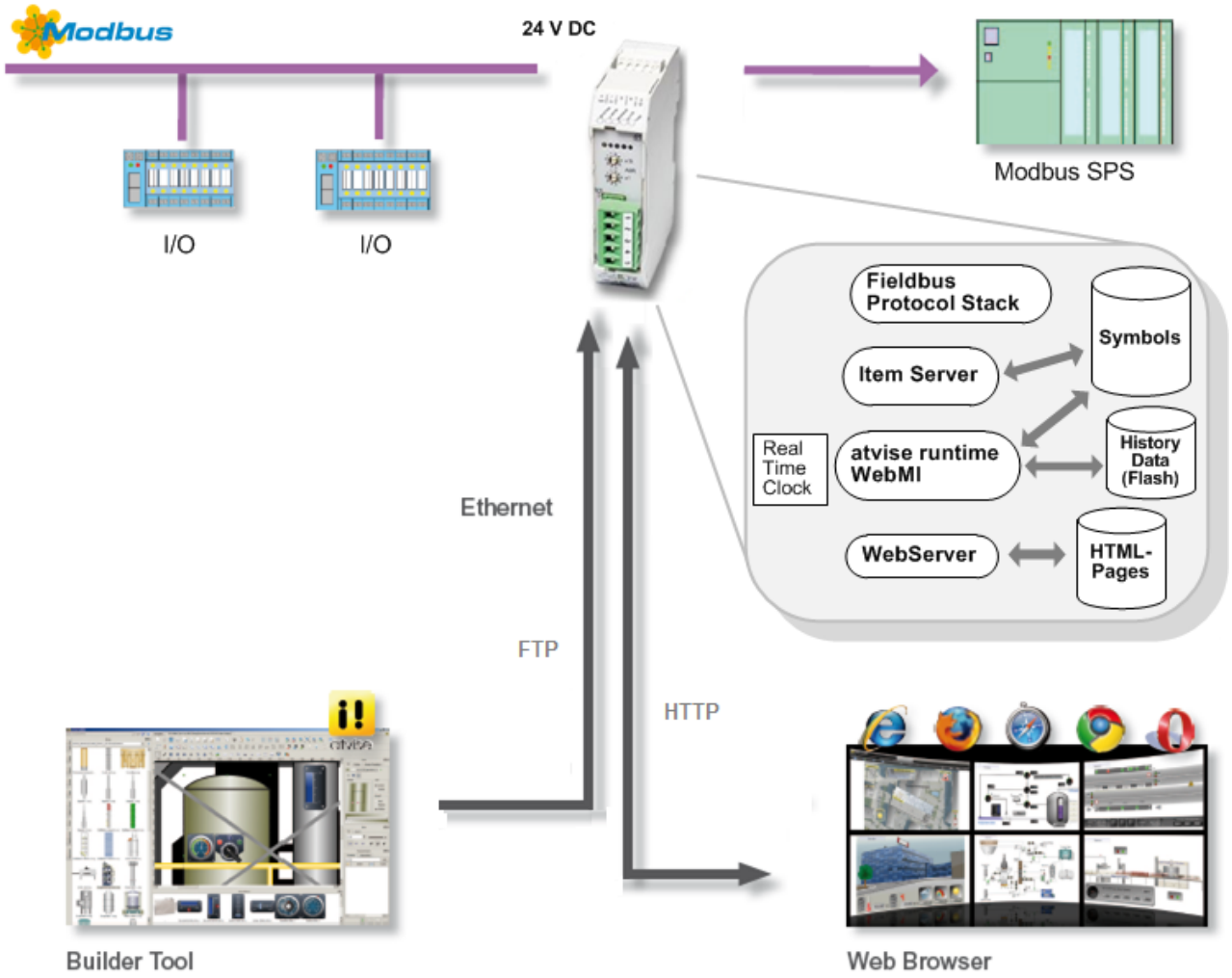

Figure 2: Overview data flow netSCADA NSCD-T52-RS/ATVISE/MBR

The device is equipped with a real-time clock and a trend data buffer (8 MByte Flash) for non-volatile selective storage of signal values.

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4 Requirements

4.1 Requirements for operating the netSCADA devices

The following preconditions must be met in order to operate the netSCADA devices successfully:

- The supply voltage must be in the range between 18 V and 30 V DC.
- An Ethernet connection between the configuration PC and the netSCADA device must have been established.
- The netSCADA device must have a valid IP address which is accessible from the configuration PC.
- License for atvise builder must be installed.
- Visualization project has been successfully downloaded to the device.
- Web browser.

4.2 System requirements for the configuration PC

- PC with 1 GHz processor or higher
- Windows XP SP3, Windows 7 (32 bit) SP1 or Windows 7 (64 bit) SP1
- Administrator privilege required for installation
- DVD ROM drive
- Graphic resolution: min. 1024 x 768 pixel
- Keyboard and mouse

4.3 System requirements atvise builder

4.3.1 Supported web browser

The web contents produced by atvise builder can be displayed by all web browsers, which support the web standards JavaScript (according to standards ECMA 262 or ISO/IEC 16262, see http://www.ecma-international.org/publications/files/ECMA-ST/ECMA-262.pdf) and SVG (according to W3C standard, see http://www.w3.org/TR/SVG11/). This applies for newer versions of all commonly used web browsers.

A more precise list of the Web browsers having been tested with atvise by its manufacturer can be obtained at http://www.atvise.com/en/vendors/compatibilitylist.

For configuring the netSCADA device, a web browser is also needed on the configuration PC.

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4.3.2 Required disk space

The atvise builder requires approximately 128 MB of memory on hard disk if completely installed with all options depending on the size of the project database *nodes.db*.

The additional software components installed together with atvise require about 12.5 MB disk space.

Additional space may also be required for the Microsoft .NET Framework, if this has not already been installed previously on your PC.

4.3.3 Internet connection for installing atvise software

Important:
During installation of the atvise builder, access to the Internet is required for registering and licensing purposes. During the registration phase of the atvise installation, an internet connection to the Certec EDV GmbH (http://www.atvise.com), the manufacturer of atvise, is established. The internet connection must not be blocked by a firewall, i. e. `port 1099` must be available for the atvise installation procedure. If the online licensing does not succeed, a license key can be requested and installed via the project console of the installed atvise builder software. To do so, it is necessary to create a web account, to order a license and to invoke the license key under the created account.

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5 Device drawings and connectors

5.1 Dimensional drawings

NL 50N-MPI-ATVISE

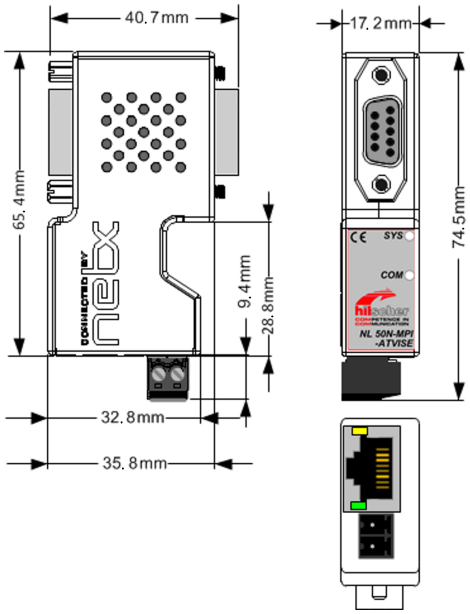

Figure 3: Dimensional drawing NL 50N-MPI-ATVISE

NSCD-T52-RS/ATVISE/MBR

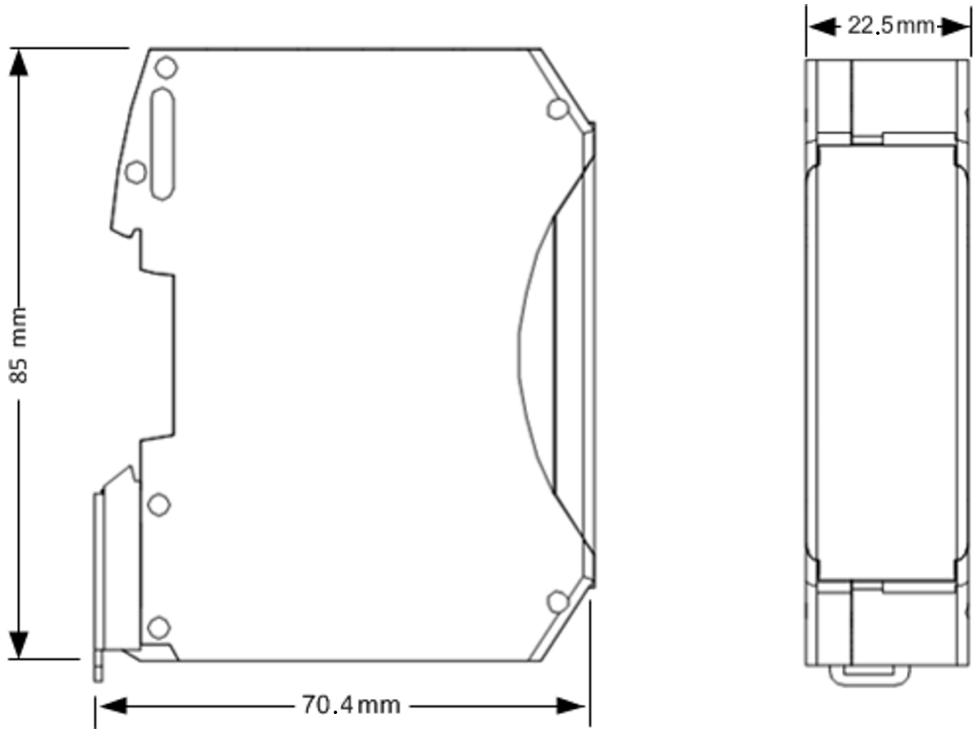

Figure 4: Dimensional drawing NSCD-T52-RS/ATVISE/MBR

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5.2 Connectors and LEDs

5.2.1 Overview connectors and LEDs NL 50N-MPI-ATVISE

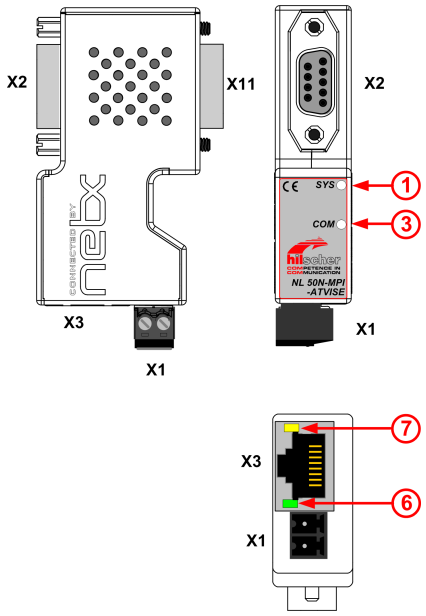

Figure 5: Connectors and LEDs NL 50N-MPI-ATVISE

Element position	Description	For details refer to
X1	Connector for power supply	Section *External power supply* [▷ page 27]
X2	NL 50N-MPI-ATVISE: PROFIBUS connector 9 pin, D-Sub female	Section *PROFIBUS interface (NL 50N-MPI-ATVISE)* [▷ page 25]
X3	Ethernet connector RJ45	Section *Ethernet interface* [▷ page 24]
X11	PROFIBUS connector 9 pin, D-Sub male 1:1 connection with X2)	Section *PROFIBUS interface (NL 50N-MPI-ATVISE)* [▷ page 25]
1	SYS LED	Section *LEDs NL 50N-MPI-ATVISE* [▷ page 111]
3	S7 COM LED	
6	LED, green LINK (Connection) at X3	
7	LED, yellow, ACT (Activity) at X3	

Table 8: Connectors and LEDs NL 50N-MPI-ATVISE

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5.2.2 Overview connectors and LEDs NSCD-T52-RS/ATVISE/MBR

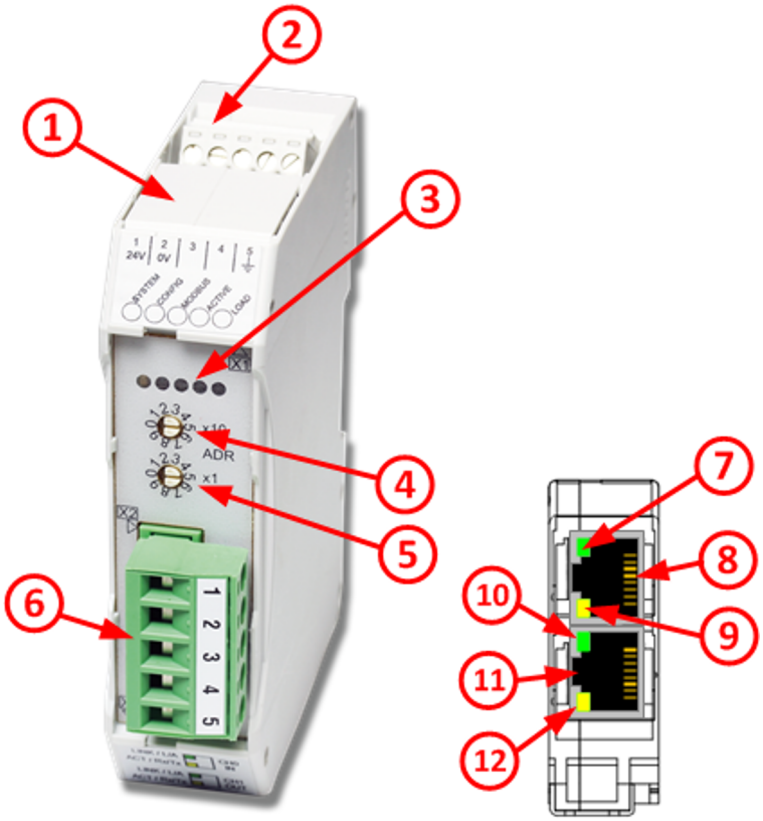

Figure 6: Connectors and LEDs NSCD-T52-RS/ATVISE/MBR

Position	Description	For details refer to
1	Mini USB service interface (protected by a cover) for resetting the device to its “factory settings” (firmware reset/recovery)	Chapter *Firmware recovery of NSCD-T52-RS/ATVISE/MBR via USB* [▷ page 106]
2	**X1** Connector for power supply	Section *External power supply* [▷ page 27]
3	**LEDs**: SYSTEM CONFIG MODBUS ACTIVE LOAD	Section *LEDs NSCD-T52-RS/ATVISE/MBR* [▷ page 112]
4	Address rotary switch (multiplied 10)	Not used
5	Address rotary switch (multiplied 1)	
6	**X2** Modbus RTU connector (COMBICON)	Section *Modbus RTU interface (NSCD-T52-RS/ATVISE/MBR)* [▷ page 26]
7	LED, green LINK (Connection) CH0 (IN)	Section *LEDs NSCD-T52-RS/ATVISE/MBR* [▷ page 112]
8	**X3** Ethernet connector RJ45 CH0 (IN)	Section *Ethernet interface* [▷ page 24]
9	LED, yellow, ACT (Activity) CH0 (IN)	Section *LEDs NSCD-T52-RS/ATVISE/MBR* [▷ page 112]
10	LED, green LINK (Connection) CH1 (OUT)	
11	**X3** Ethernet connector RJ45 CH1 (OUT)	Section *Ethernet interface* [▷ page 24]
12	LED, yellow, ACT (Activity) CH1 (OUT)	Section *LEDs NSCD-T52-RS/ATVISE/MBR* [▷ page 112]

Table 9: Connectors and LEDs NSCD-T52-RS/ATVISE/MBR

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5.2.3 Ethernet interface

The Ethernet connector of the netSCADA is connected to a switch, hub or Ethernet end device by an Ethernet cable Category 5 (CAT5) or higher, which consists of 4 wires twisted pair-wise and allows a maximum transmission rate of 100 MBit/s.

Parameter	Value
Medium	Double twisted pair copper cable (2x2 wires), CAT5 (100 MBit/s)
Length of line	max. 100 m
Transmission rate	10 MBit/s / 100 MBit/s

Table 10: Data of Ethernet connection

Ethernet Pin Assignment at the RJ45 Socket

The device operates its Ethernet interface in the Auto-crossover mode. Thus for the connection with Ethernet devices both crossover cables and patch cables are applicable.

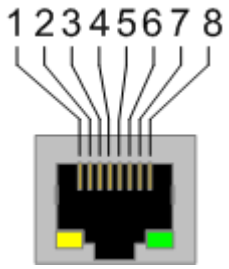
Ethernet	Pin	Signal	Description
 RJ45 socket female	1	TX+	Transmit data positive
	2	TX–	Transmit data negative
	3	RX+	Receive data positive
	4	Term 1	**Connected and terminated to PE via RC combination***
	5	Term 1	
	6	RX–	Receive data negative
	7	Term 2	**Connected and terminated to PE via RC combination***
	8	Term 2	
			* Bob Smith Termination

Table 11: RJ45 Ethernet pin assignment

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5.2.4 PROFIBUS interface (NL 50N-MPI-ATVISE)

D-Sub connector (9 pin, male and female)

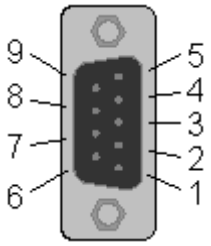
NL 50N-MPI-ATVISE	
 PROFIBUS interface (D-Sub female connector, 9 pin)	The X2 D-Sub male connector connects the device to a S7 PLC (or to any free network connector along a PROBIBUS or MPI bus). The pins of X2 D-Sub male and the X11 D-Sub female connector have a 1 to 1 connection.

Table 12: Description PROFIBUS interface (D-Sub Connector, 9 pin)

Connection with DSub male / female connector	Signal	Description
1	-	unused, is only connected through
2	GND	Ground (for VS)
3	RxD/TxD-P	Receive / Send Data-P respectively connection B plug
4	-	unused, is only connected through
5	ISOGND	Reference potential (PROFIBUS)
6	-	unused, is only connected through
7	VS	Supply voltage input (24 V), alternatively to X1
8	RxD/TxD-N	Receive / Send Data-N respectively connection A plug
9	-	unused, is only connected through
Shield	Shield	

Table 13: Pinning PROFIBUS MPI interfaces (D-Sub female and male connector, 9 pin)

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5.2.5 Modbus RTU interface (NSCD-T52-RS/ATVISE/MBR)

The Modbus RTU interface (**X2**, see position ⑥ in section *Overview connectors and LEDs NSCD-T52-RS/ATVISE/MBR* [page 23]) supports the interface types RS-232, RS-422 and RS-485. You have to select the right interface type in the atvise builder when you configure the visualization project (see section *Configuring Modbus RTU parameters* [page 64]).

NOTICE

Device damage by compensating current

The reference potential of the power supply and the reference potential of the RS-232/RS-422/RS-485 interface are galvanically connected.
Avoid compensating currents between the reference potentials of the devices connected via RS-232/RS-422/RS-485!

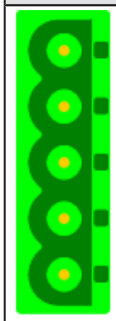
RS-232 at X2	Pin	Signal	Description
 COMBICON socket, 5-pole	1	GND	Reference potential: non-isolated
	4	RxD	Receive data
	5	TxD	Transmit data

Table 14: Pin assignment RS-232 interface (COMBICON socket, 5-pole)

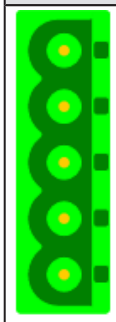
RS-422 at X2	Pin	Signal	Description
 COMBICON socket, 5-pole	2	RxD -	Receive data negative
	3	RxD +	Receive data positive
	4	TxD +	Transmit data positive
	5	TxD -	Transmit data negative

Table 15: Pin assignment RS-422 interface (COMBICON socket, 5-pole)

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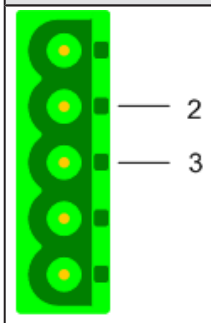
RS-485 at X2	Pin	Signal	Description
 COMBICON socket, 5-pole	2	RxD / TxD -	Receive data / Transmit data negative
	3	RxD / TxD +	Receive data / Transmit data positive

Table 16: Pin assignment RS-485 interface (COMBICON socket, 5-pole)

5.2.6 External power supply

The netSCADA devices can be operated with an external DC supply voltage of 24 V (18 V – 30 V) at **X1**.

NL 50N-MPI-ATVISE

NOTICE

Device damage NL 50N-MPI-ATVISE

When using an external supply voltage, the reference potential of this external supply voltage is galvanically coupled to that of the PROFIBUS. This requires **mandatorily** the power supply to be **potential-free**.

➢ Plug the power supply cable onto the external power supply connector at the bottom side of the device (see **X1** in section *Overview connectors and LEDs NL 50N-MPI-ATVISE* [page 22]).

Supply voltage pin assignment Mini Combicon socket

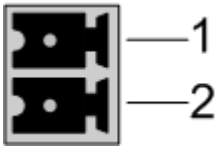
Supply voltage	Pin	Signal	Description
 Mini Combicon	1	0 V / GND	Ground of supply voltage
	2	24 V	+24 V supply voltage

Table 17: Supply voltage pin assignment

NSCD-T52-RS/ATVISE/MBR

➢ Plug the power supply cable onto the external power supply connector at the top side of the device (see position ② in section *Overview connectors and LEDs NSCD-T52-RS/ATVISE/MBR* [page 23]).

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5.3 Galvanic isolation schematic diagrams

NL 50N-MPI-ATVISE

At the netLINK SCADA NL 50N-MPI-ATVISE, the PE connection is made via the protective cover of the plug (connection between the shields of the data cables).

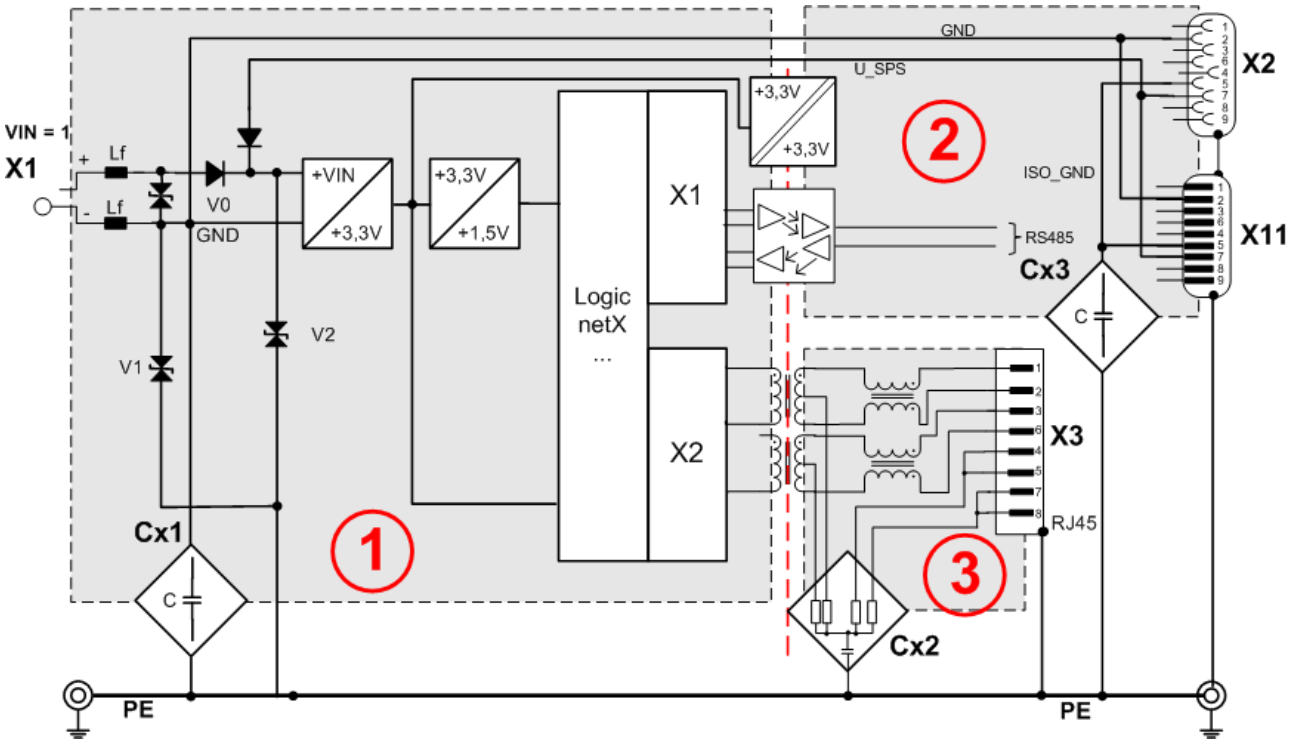

Figure 7: Galvanic isolations NL 50N-MPI-ATVISE

Area connection	Protocol	galv. isolation	Coupling	Coupling against PE potential	Functional earthing to PE
① **X1**	-	no	HF ①	Lf = 47 µH	-
			Cx1 ①	1 * 1 nF / 1000 V 1 * 22 pF / 63 V	
② **X2**	PROFIBUS DP	inductive	Cx2 ②	1 MΩ // 2.2 nF/ 500 V	directly via the metal connection of the D-Sub female connector
③ **X3**	Ethernet	inductive	Cx3 ③	4 * 75 Ω, 1 nF / 2000 V	directly via the metal connection of RJ 45 sockets

Table 18: Coupling NL 50N-MPI-ATVISE

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NSCD-T52-RS/ATVISE/MBR

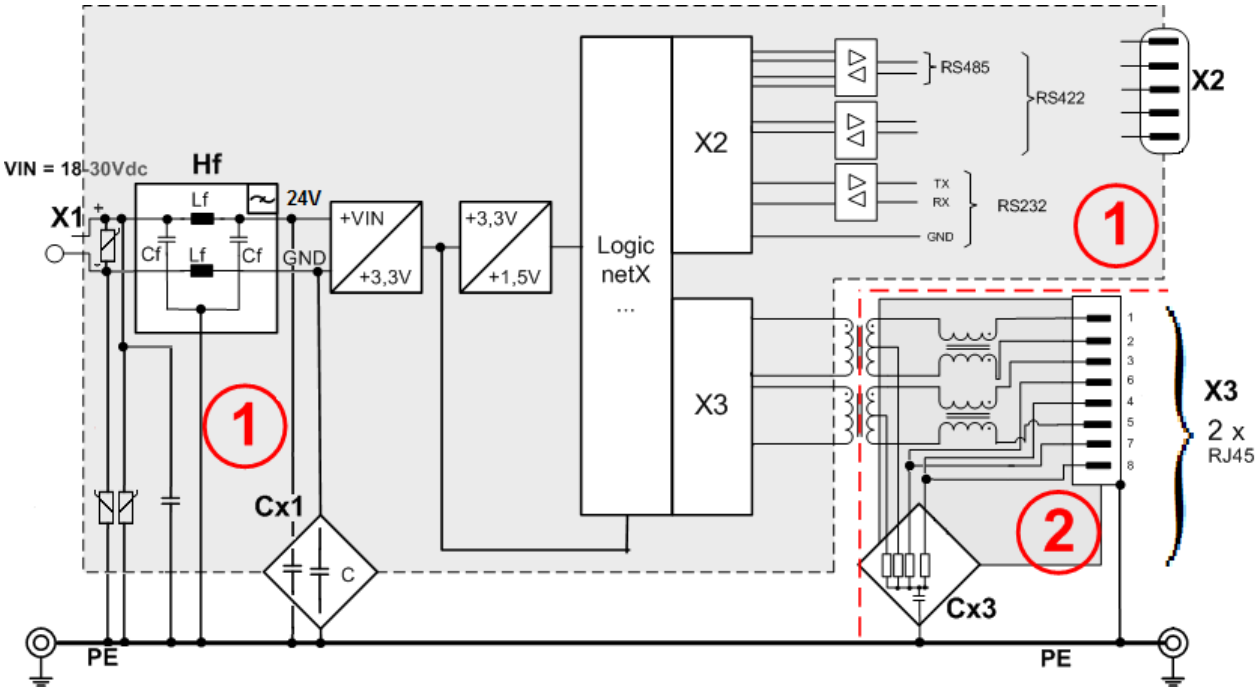

Figure 8: Galvanic isolations NSCD-T52-RS/ATVISE/MBR

Area connection	Protocol	galv. isolation	Coupling	Coupling against PE potential	Functional earthing to PE
(1) **X1**	-	no	HF (1)	Cf = 10nF / 500 V, Lf = 100 µH	Pin 1 X1 directly connected to PE
			Cx1 (1)	2 * 10 nF / 500 V	
(1) **X2**	RS232 RS422 RS485	⚠ no	-	-	No connection via connector X2
(2) **X3**	Ethernet	inductive	Cx3 (2)	4 * 75 Ω + 1 nF / 2000 V	Directly connected via the metal housing of RJ45 sockets

Table 19: Coupling NSCD-T52-RS/ATVISE/MBR

Important:
For this device it is recommended to implement a galvanic isolation within the voltage supply of the device.

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6 Mounting and dismounting of the devices

Mounting/dismounting NL 50N-MPI-ATVISE

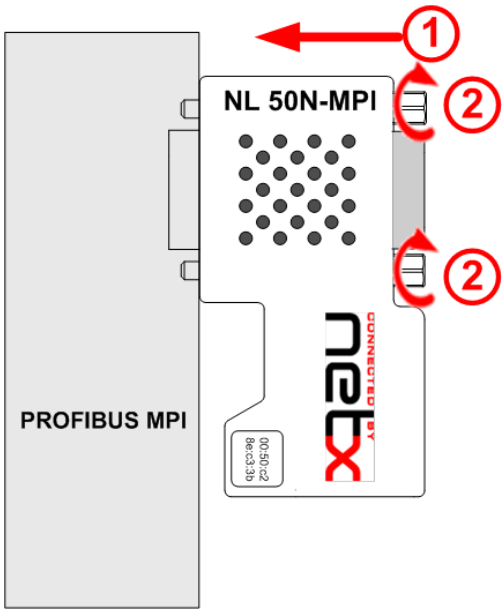

Figure 9: Mounting NL 50N-MPI-ATVISE

The netLINK SCADA NL 50N-MPI-ATVISE is plugged onto an S7 PROFIBUS-MPI interface or any other compatible device with its PROFIBUS-MPI interface ① and fixed by screws ②.

Note:
The netLINK SCADA can also be connected to any free network connector in a PROFIBUS or MPI bus. Note, that in this case, the device needs an external 24V voltage supply.

For dismounting, loosen the screws ② and disconnect the NL 50N-MPI-ATVISE from the PROFIBUS interface.

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Mounting NSCD-T52-RS/ATVISE/MBR

Mount the NSCD-T52-RS/ATVISE/MBR onto a top hat rail according to DIN EN 60715. The top hat rail has to be attached horizontally at the intended location.

Important:
The top hat rail has to be connected with a potential equalization conductor (PE). The rear of the netSCADA device is equipped with a grounding contact. Thus, grounding is achieved automatically via contact with the potential equalization conductor of the top hat rail.

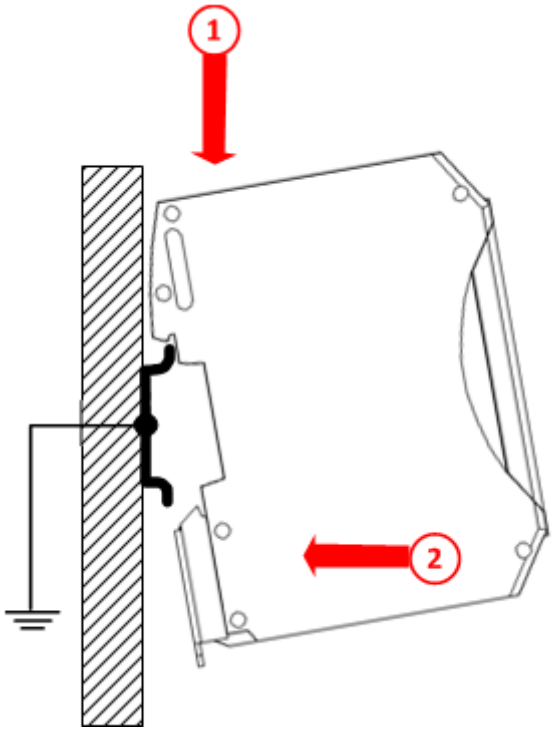

Figure 10: Mounting NSCD-T52-RS/ATVISE/MBR

- Push the device onto the top hat rail from above ①.
- Then press the device against the rail until the bolt of the lower hook engages ②.

After mounting, connect the 24 V supply voltage to the device. Grounding is done via the grounding contact located at the backside of the device, connecting it electrically to the DIN top hat rail.

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Removing NSCD-T52-RS/ATVISE/MBR from top hat rail

➢ In order to remove the device from the top hat rail, first remove the power supply cable and all data cables from the device.

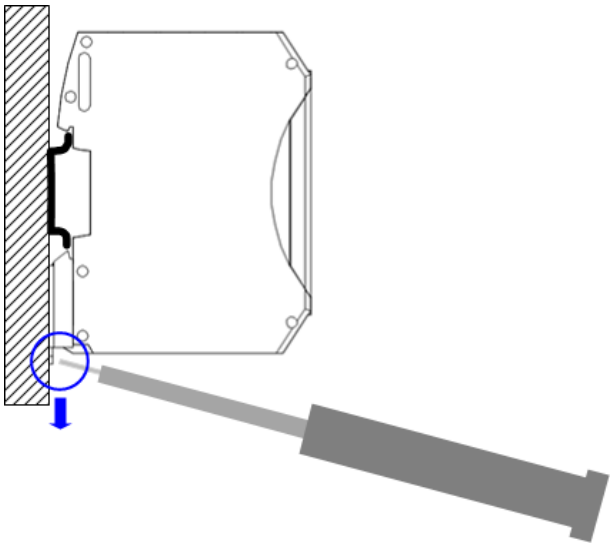

Figure 11: Dismounting NSCD-T52-RS/ATVISE/MBR

➢ Put a screw driver into the slot of the latch at the bottom of the device.

➢ To disengage the lock of the hook, pull down the latch with the screw driver.

➢ Take the device off the top hat rail.

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7 Installing the software

Overview

The software installation program on the netSCADA DVD contains all software components needed for installation under Windows.
It automatically detects, what components are already present on your system and what components still need to be installed.

You can start the installation program in the menu of the start screen of the netSCADA DVD. Instructions for this are provided below.

If you have an older version of the atvise builder installed on your PC:

The installation program on the DVD features a routine which automatically uninstalls any older version of the atvise builder from your PC. Please note that the old atvise database file called *nodes.db* (usually stored in the `C:\Program Files (x86)\atvise` directory) will not be deleted from the PC by the uninstallation process, neither by the uninstallation routine which is part the installation program started from the DVD, nor by the **Uninstall or change a program** feature of the Windows **Control Panel**.

If you want to keep this database file for future use, it might in some cases be necessary to convert an old incompatible *nodes.db* file into a version that is compatible with the new atvise builder. During installation of the new atvise builder, you will be asked whether the installation routine shall backup the old *nodes.db* database file as *nodes.bak*. If you choose **No**, the old *nodes.db* file will be overwritten and is lost for future use. If you choose **Yes**, you can later use the **atvise database maintenance** tool (after having installed the new atvise software) to update this old database file to the new atvise version (i. e. make it compatible to the new atvise builder), and can thus use the old file with your new software.

Further information on updating old atvise database files belonging to old atvise builder versions can be found in the PDF documents in the atvise installation folder (usually the `C:\Program Files (x86)\atvise` directory).

Prerequisites for installation

- You need administrator rights for installation under Windows.
- An internet connection is required for registration and licensing purposes. In any case, it must not be blocked by a firewall, i. e. port 1099 must be available for the installation procedure of the atvise builder!

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Step-by-step instructions

- ➢ Close all application programs on the PC onto which you intend to install the atvise Software.
- ➢ Insert the DVD into the local DVD ROM drive of your PC.
- ↬ If the auto start feature of your PC is enabled, the start screen of the DVD opens automatically.
- ➢ If the auto start feature on your PC is disabled, change to the root directory of the DVD and double-click the *netSCADA.exe* file.
- ↬ The start screen of the DVD appears:

Figure 12: Start screen netSCADA DVD

- ➢ In the menu of the start screen, select **Install Web Visualization atvise**
- ↬ The installation program opens:

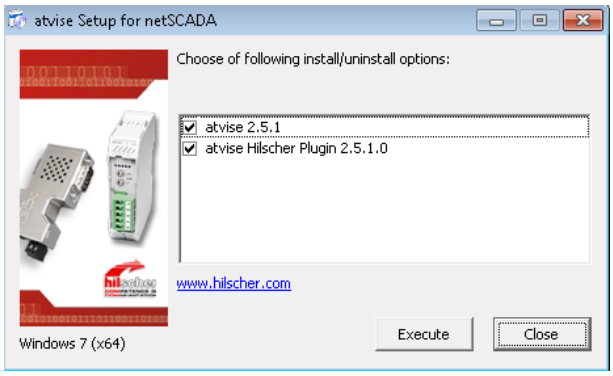

Figure 13: atvise installation program

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Note:
The **installations/uninstall options** listed in the dialog window depend on the configuration of your PC. The configuration is automatically checked by the installation program, therefore you should not deselect any of the preselected options. If you do otherwise, the operability of the whole installation might be impaired.

➢ Click **Execute**.

↬ The installation routines are started. What dialog windows are displayed in the course of the installation process depends on the configuration of your PC. If, for instance, an older version of the atvise builder is still present on your PC, this older version will automatically be removed first.

➢ Follow the instructions given in the dialog windows of the installation program.

↬ The Installation program installs the atvise Software.

↬ If an old *nodes.db* database file is found on your PC during installation, the following dialog appears:

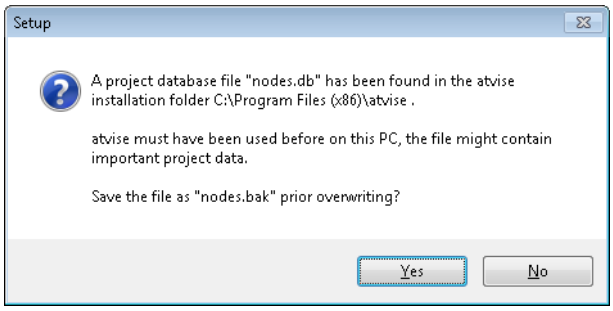
Setup
A project database file "nodes.db" has been found in the atvise installation folder C:\Program Files (x86)\atvise .
atvise must have been used before on this PC, the file might contain important project data.
Save the file as "nodes.bak" prior overwriting?
Yes
No

Figure 14: Save nodes.bak dialog

➢ If you want to reuse your old database file with the new atvise builder version, choose **Yes**.

↬ After the atvise builder software has been installed and licensed, the setup routine for the **atvise Hilscher Plugin** starts.

➢ Read the license agreement and click **I accept the agreement**, if you accept the terms of the license agreement.

➢ Click **Next**, then click **Install**.

⇨ After having finished the installation process, a message will be shown.

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8 Creating visualization with the atvise builder

8.1 Overview

This chapter describes how to use the atvise builder to create your visualization project and the web contents, and how to download the project to the netSCADA.

The atvise builder software works with symbolic names of the data points when generating a visualization and assigning the graphics to the corresponding data reference. No direct addresses of data points of the device to be visualized need to be specified; instead, a mapping table of the physical addresses and the data points has to be configured in the **Signal Editor** once.

netLINK SCADA NL 50N-MPI-ATVISE

The atvise builder contains an interpreter called **Symbolizer** for STEP7 projects and is capable of importing symbols and variables directly from the STEP7 project and making them accessible as data points within atvise. For generating the reference data, with which the S7 PLC will be accessed, the corresponding STEP7 project can be loaded directly into atvise. The reference data are then simply assigned by selection.

You can also configure the symbols yourself; but you always need a STEP7 file for this. If you haven't got a STEP7 file at your disposal, you can find an empty STEP7 file on the netSCADA Solutions DVD in the `Supplements & Examples\Example Projects\Symbolless, empty STEP7 Project` folder.

Note:
The netSCADA device cannot be used for programming the SIMATIC S7 PLC.
For this purpose, a netLINK NL 50-MPI or netTAP NT 50-MPI device from Hilscher is needed.

netSCADA NSCD-T52-RS/ATVISE/MBR

The variables/signals of the Modbus which are to be visualized by the netSCADA NSCD-T52-RS/ATVISE/MBR device can be configured directly in the **Signal Editor**, an interpreter like the **Symbolizer** is not needed for this.

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8.2 Starting the atvise builder

Step-by-step instructions

To start the **atvise builder**, you must first open the **Project Console** via the Windows **Start menu** or via the Windows **Task bar**:

1. Open **Project Console**.

➢ To open **Project Console** via Windows **Start menu**:
Choose **Start** > **All Programs** > **atvise** > **Project Console**.

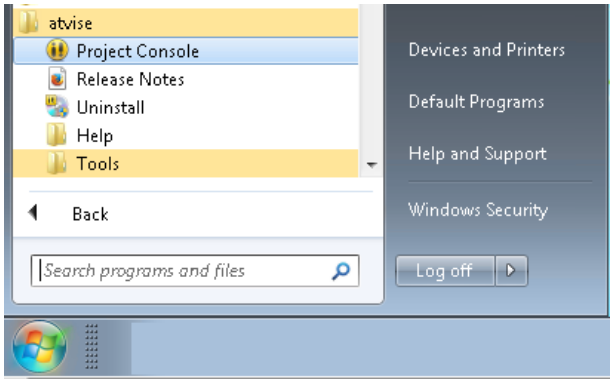

Figure 15: Open Project Console via Windows Start menu

↬ The **Project Console** opens.

➢ To open **Project Console** via Windows **Task bar**:
In the right corner of the **Task bar**, click symbol.

↬ The following menu opens:

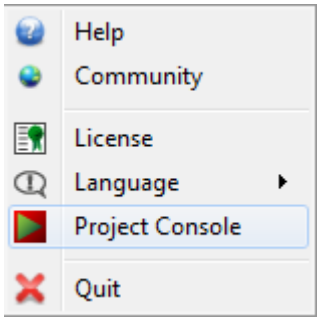

Figure 16: Menu of Project Console

➢ Click **Project Console** entry.

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The **Project Console** opens:

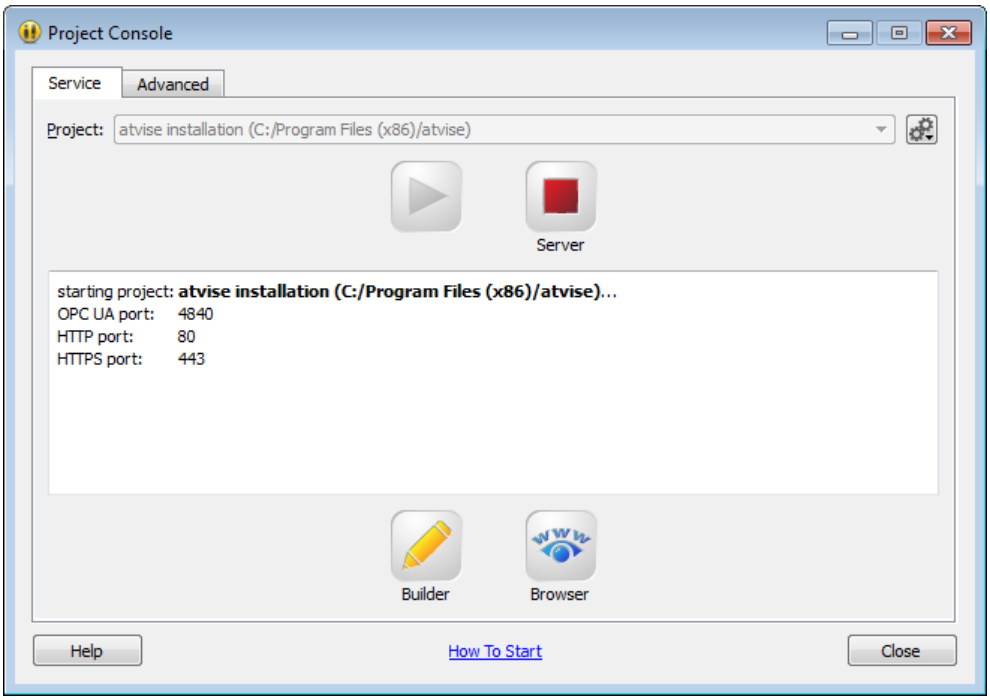

Figure 17: Project Console

2. Start atvise builder.

   ➢ In the **Project Console**, click **Builder** button.

   If you are starting the atvise builder for the first time and/or if you have not defined a **WebMI Server** for your project yet, the **Add webMI Server** dialog opens. This dialog window appears prior to the start screen of the “actual” atvise builder GUI, i. e. the editor in which you can create the visualization.

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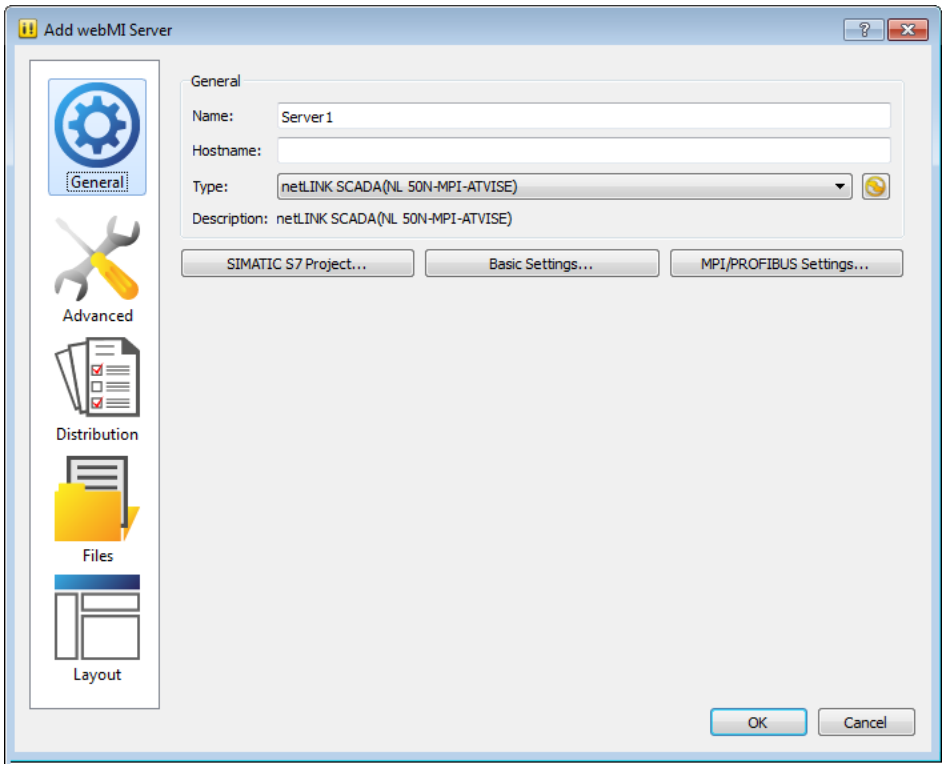

Figure 18: Add webMI Server dialog

- You can now configure your netSCADA device in the **Add webMI Server** dialog (for details see section *Configuring netLINK SCADA device* [▶ page 45] respectively section *Configuring netSCADA device* [▶ page 62]).
  If you don't want to use the preset default IP address `192.168.0.133` for your netSCADA device, you can click the **Basic Settings…** button to open the **LAN Scanner and Configuration Tools** (which is integrated as plug-in in the atvise builder) and then use the tool to assign a suitable temporary IP address to your device (see section *Assigning temporary IP address* [▶ page 41]).
- If you want to start the atvise builder GUI instantly, and finish the configuration of your netSCADA device as WebMI Server in this dialog window later, click the **OK** button in order to close this dialog window now.

Note:
If you want to re-open this configuration dialog window later, in order to finish the configuration of the netSCADA, double-click the server entry in the project tree of the atvise builder. The re-opened configuration dialog window is then called **Edit webMI Server** and not **Add webMI Server** like before.

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⇨ The start screen of the atvise builder appears:

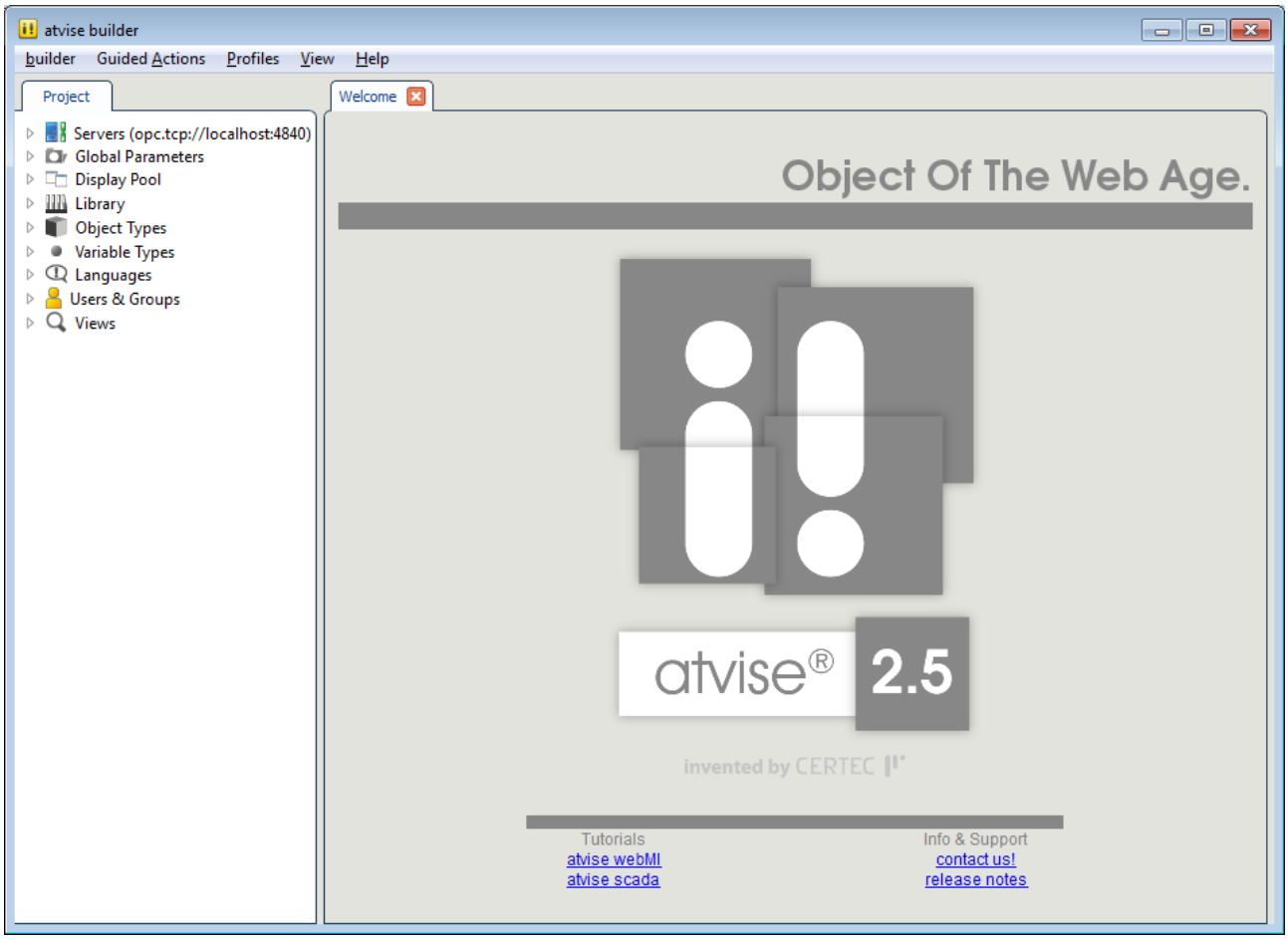

Figure 19: Start screen atvise builder

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8.3 Assigning temporary IP address

In its state of delivery, the netSCADA device has the IP address 192.168.0.133.
If this preset address is not suitable for you, you must first assign a new temporary IP address to the device by using the **LAN Scanner and Configuration Tool**, which is integrated as plug-in in the atvise builder software.

Important:
Take care that the netSCADA device can be reached by the configuration PC via the **local** Ethernet network.

To start the **LAN Scanner and Configuration Tool**, you first need to open the **Add webMI Server** respectively the **Edit webMI Server** dialog window. The **Add webMI Server** dialog window opens automatically when you start the atvise builder and haven't yet defined a WebMI Server for your project yet. The **Edit webMI Server** dialog window will be opened if you have already defined a WebMI Server. In that case, you can select this WebMI Server in the project tree of the atvise builder and then choose **Edit Server…** from the context menu, in order to open the dialog window.

1. Start **LAN Scanner and Configuration Tool**.
   ➢ In the opened **Add webMI Server** respectively **Edit webMI Server** dialog window, click **Basic Settings…** button.

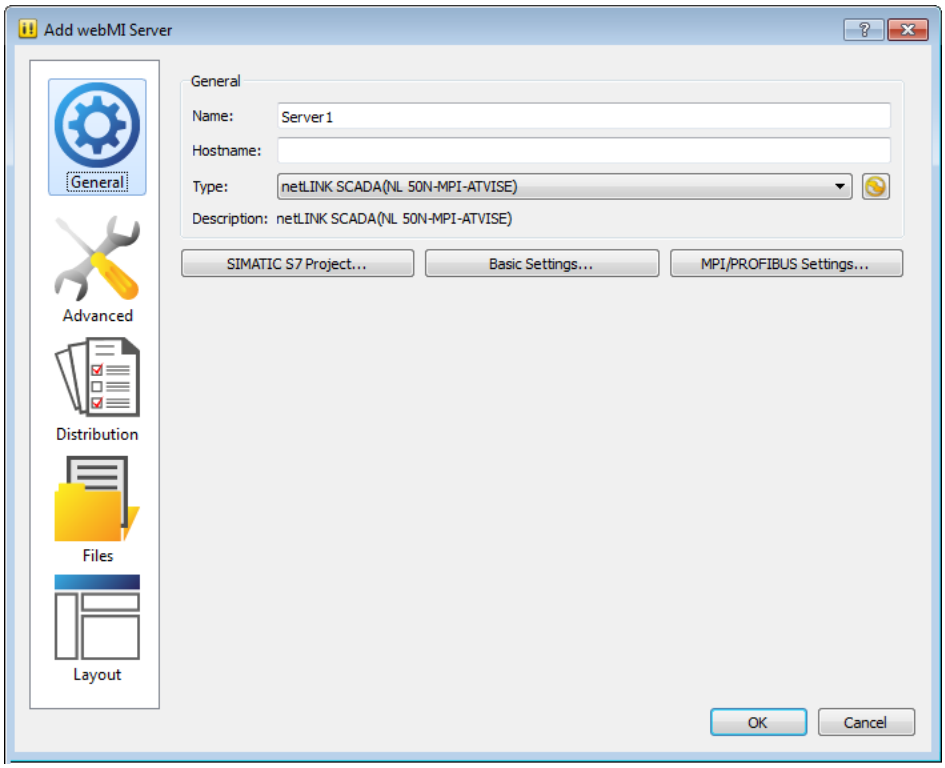

Figure 20: webMI Server dialog window

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➭ The **LAN Scanner and Configuration Tool** opens.

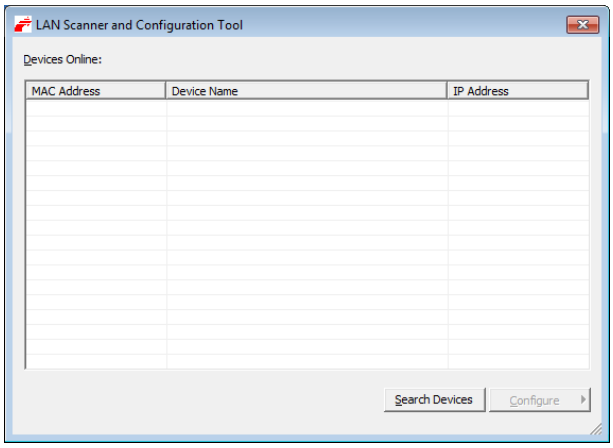

Figure 21: LAN Scanner and Configuration Tool (1)

2. Search for netSCADA devices.
   - ➢ Click **Search Device** button.
   - ➭ The tool now searches for connected netSCADA devices in all Ethernet networks available for the configuration PC. All found devices are listed:

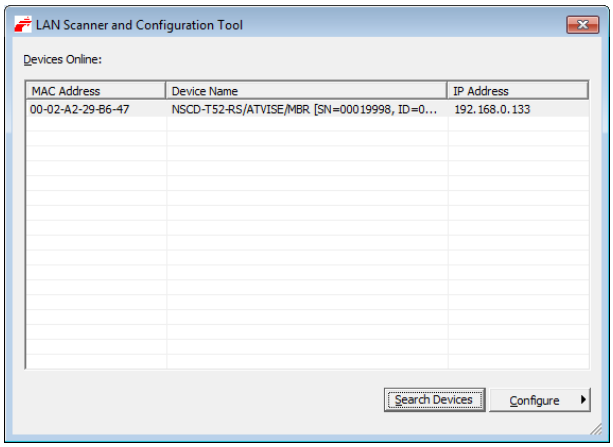

Figure 22: LAN Scanner and Configuration Tool (2)

3. Set IP Address.
   - ➢ Select the device for which you want to assign a temporary new IP address.
   - ➢ Click **Configure** button, then choose **Set temporary IP Address…**

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➮ The **IP Configuration** dialog box appears:

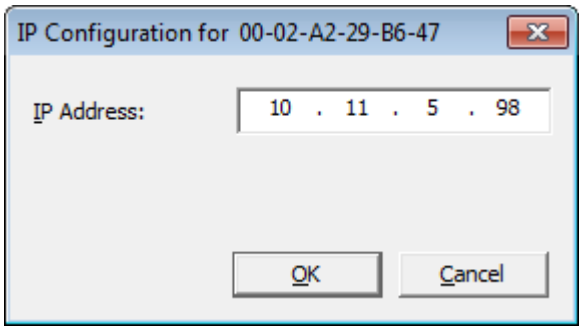

Figure 23: Set IP address

➢ Enter the IP address by which the netSCADA shall be accessed by your configuration PC.

➢ Click **OK** button.

⇨ The IP address is set temporarily in the device (and remains valid until next power-on cycle).

Important:
In order to set the IP address permanently, so that it remains valid even after power-fail, you later have to use the Web Configuration Interface of the netSCADA device (see section *Using the Web Configuration Interface of the netSCADA devices* [page 87]).

If you want to connect directly with the Web Configuration Interface of the netSCADA device, e. g. in order to configure a permanent (remanently stored) IP address for your device, you can do so instantly from within the **LAN Scanner and Configuration Tool** by clicking the **Configure** button, then choosing **Open Web Configuration Page…** entry from the context menu. The standard web browser of your configuration PC starts and connects to the login dialog of the Web Configuration Interface of the netSCADA device.

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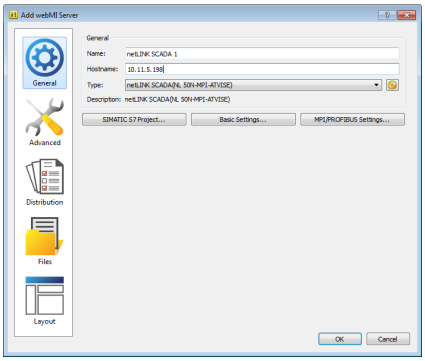
8.4 Creating project for NL 50N-MPI-ATVISE (netLINK SCADA for PROFIBUS MPI)

8.4.1 Overview of the necessary steps

To create a visualization project for your NL 50N-MPI-ATVISE device, you need to perform the following steps:

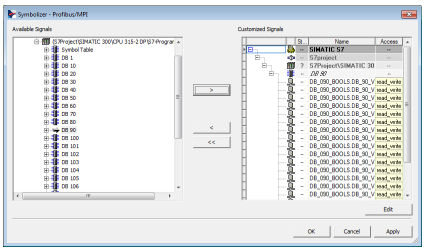
Configure netLINK SCADA

1. Enter a name
2. Under **Hostname**, enter die IP address of the netLINK SCADA device
3. Under **Type**, select **netLINK SCADA (NL 50-MPI-ATVISE)** entry
4. Assign temporary IP address (Basic Settings…)
5. Select STEP 7 project
6. Configure MPI Settings



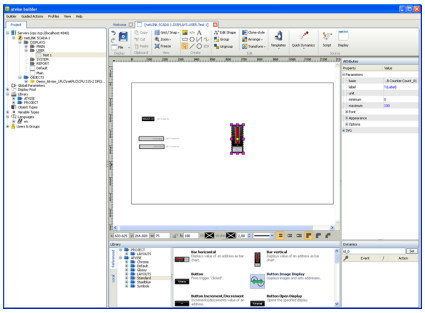
Acquire data points
(import and select symbols from STEP 7 program)

1. Select variables
2. Set access type
3. Enter PROFIBUS address of S7
4. Add marker, if necessary
5. Select variables for trending, if necessary



Create displays and link elements to data points

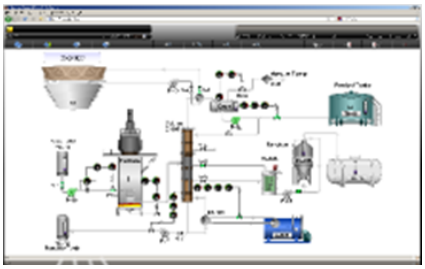
1. Select and place display elements
2. Link data points
3. Layout display



Generate (compile) displays (i. e. visualization web pages) and transfer them to the netLINK SCADA

Show generated displays (i. e. visualization web pages) in web browser

1. Connect to start page
2. Show web pages in browser



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8.4.2 Configuring netLINK SCADA device

A netSCADA-Gerät is administered within atvise as **webMI Server**. In order to select and configure the NL 50N-MPI-ATVISE as webMI Server, proceed as follows:

1. Open **webMI Server** configuration dialog window.

Note:
As long as you haven't added a **WebMI Server** yet, the **Add webMI Server** dialog window opens automatically on every start-up of the atvise builder.

➢ In the project tree of the atvise builder, select **Servers** entry. Then use the right mouse button to open the context menu and choose **Add Server…** > **WebMI**.

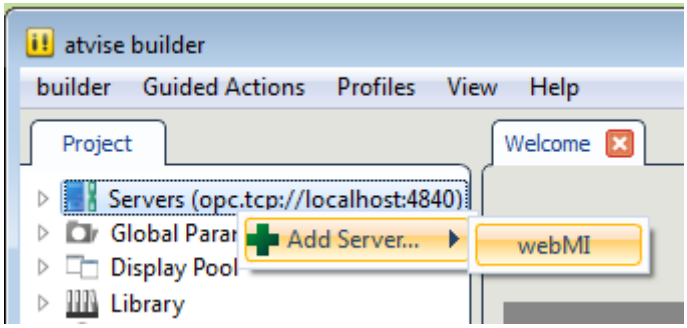

Figure 24: Add Server

Or:

➢ As an alternative, you can choose **Guided Actions** > **Add atvise webMI compliant Webserver** from the menu bar of the atvise builder.

Note:
If you have already added a "provisional" webMI Server (for example on first starting up the atvise builder software), which hasn't been properly configured yet, you can re-open the webMI Server dialog for this provisional webMI Server by selecting the entry for this server in the project tree and then choosing **Edit Server…** from the context menu. You can then complete the configuration of this provisional webMI Server in the opened **Edit webMI Server** dialog window.

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➮ The Add **webMI Server** (respectively the **Edit webMI Server**) dialog window opens with the **General** tab:

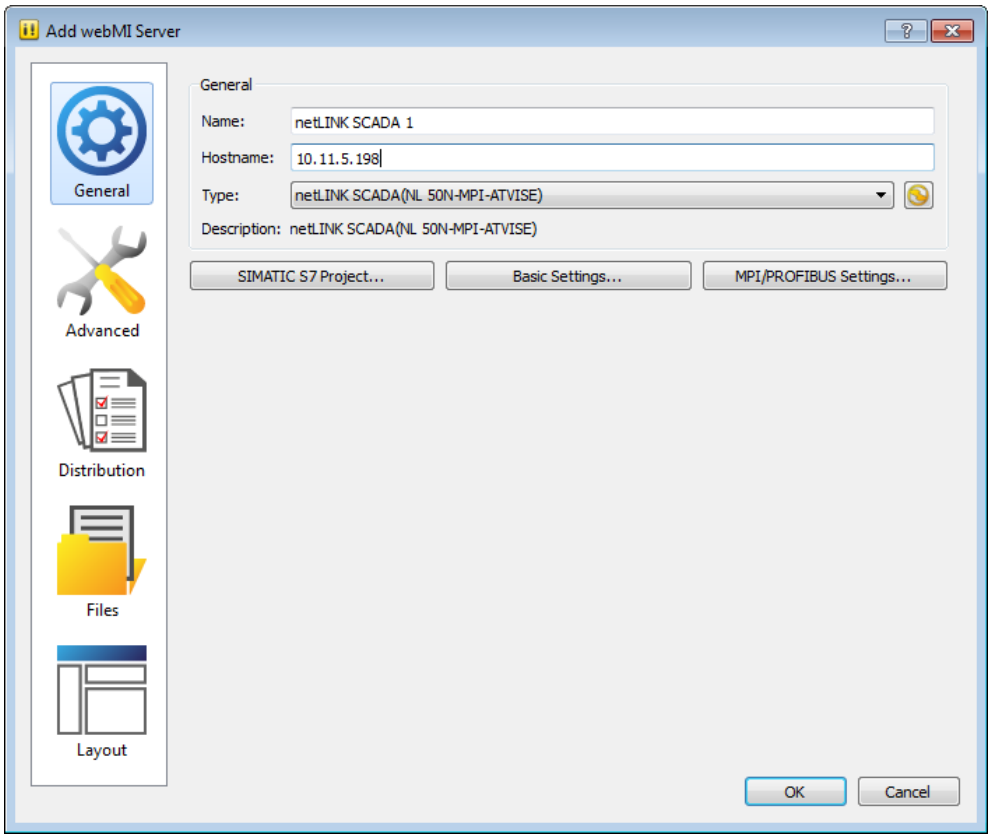

Figure 25: webMI Server dialog

2. Enter basic parameters.
   - ➢ In the **Name** field, enter a name for your server (i. e. the netLINK SCADA device).
   - ➢ In the **Hostname** field, enter the IP address (e.g. 10.11.5.98) for your server (i. e. the netLINK SCADA device).
   - ➢ In the **Type** drop-down list, select **netLINK SCADA (NL 50-MPI-ATVISE)** entry.
3. Select STEP7 project file.
   - ➢ After having selected the **netLINK SCADA (NL 50-MPI-ATVISE)** entry, the **SIMATIC S7 Project…** button becomes visible. By clicking this button, you can open a dialog, in which you can select a STEP7 Project containing the S7 components that you want to import in order to visualize them. For details, see section *Selecting STEP 7 project file* [page 48].
4. Assign temporary IP address.
   - ➢ Click **Basic Settings…** button to open the **LAN Scanner and Configuration Tool**, which is a tool for assigning temporary IP addresses. For details, see section *Assigning temporary IP address* [page 41].

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5. Configure MPI/PROFIBUS parameters.
   - ➢ Click **MPI/PROFIBUS Settings…** button to open a dialog in which you can configure the PROFIBUS-MPI settings of the netLINK SCADA. For details, see section *PROFIBUS-MPI-Parameter einstellen* [page 50].

Note:
In the **Layout** tab, you can choose a pre-defined standard layout for the visualization which you are going to create.

6. Save webMI Server.
   - ➢ After having configured the webMI Server, click **OK** button, to save the parameters of the webMI Server and to close the dialog window.
   - ⇨ You have configured the netLINK SCADA device as webMI Server.

Note:
If you want to re-open this configuration dialog window later, double-click the server entry in the project tree of the atvise builder. The re-opened configuration dialog window is then called **Edit webMI Server** and not **Add webMI Server** like before.

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8.4.3 Selecting STEP 7 project file

Note:
You need access to the entire STEP 7 project folder containing the project file (the project file can be recognized by its *.s7p extension). Thus, for instance, if you want to use the `Demo_Atv` example project provided on the product DVD make sure that you copy the entire project folder with all its subfolders before saving it on your local PC and importing it.

➢ For selecting the STEP 7 project whose data points are intended to be visualized, click on **SIMATIC S7 Project…** button in the **Edit webMI Server** dialog window (respectively **Add webMI Server** dialog window**).**

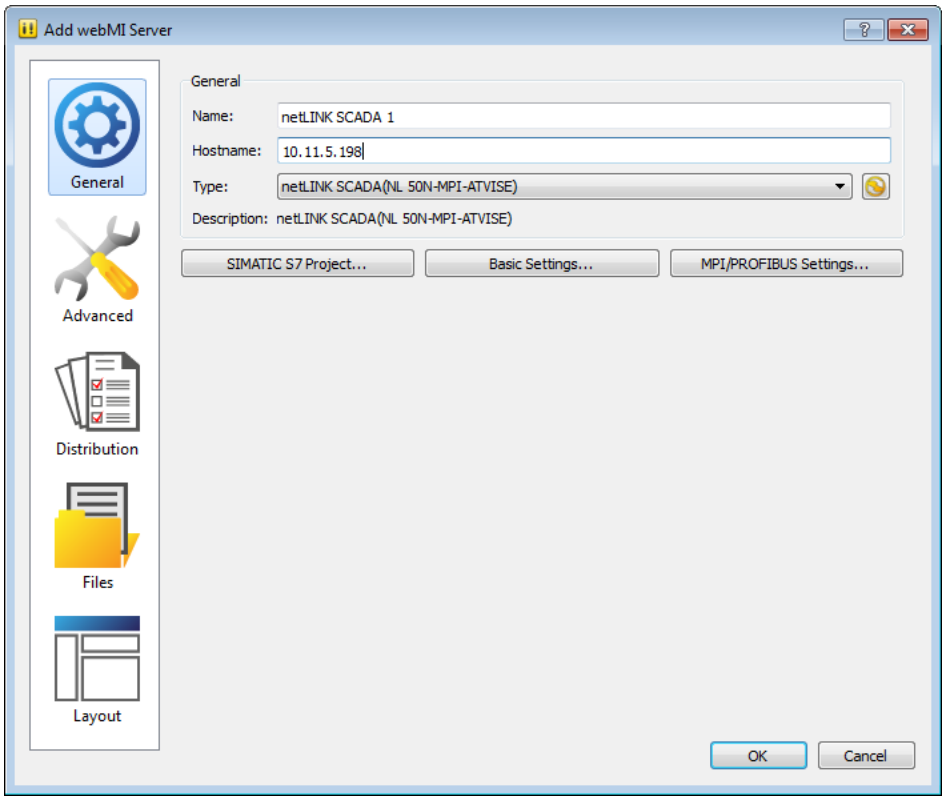

Figure 26: webMI Server dialog

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The **Choose PLC Program to Import** dialog opens, in which you can select a STEP7 project (the file name extension of the project file is *.s7p):

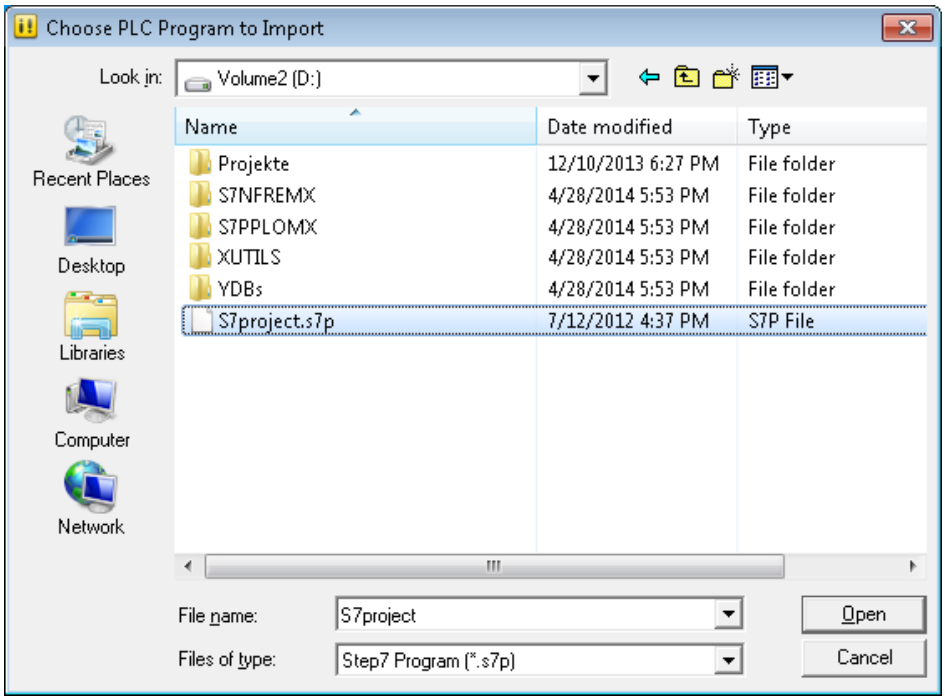

Figure 27: Selecting S7 project dialog

Select the STEP 7 project file, then click **Open**, to import the STEP 7 project file.

The STEP 7 project file is loaded and the file selection dialog closes.

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8.4.4 Configuring PROFIBUS-MPI parameter

The PROFIBUS-MPI communication parameter (like e.g. the bus address or the Baud rate) can be configured in the **MPI/PROFIBUS** dialog window.

➢ In the **Add webMI Server** (respectively **Edit webMI Server**) dialog window, click **MPI/PROFIBUS Settings…** button (see section *Configuring netLINK SCADA device* [page 45]).

➢ The **MPI/PROFIBUS** dialog window opens:

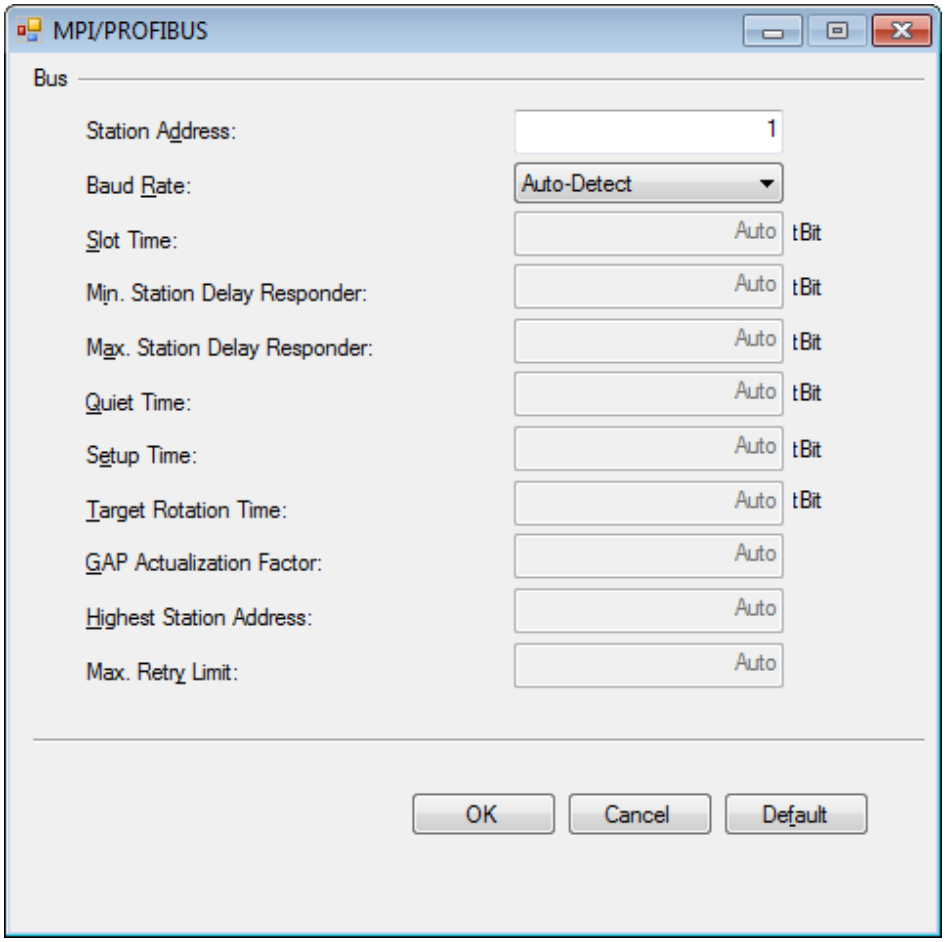

Figure 28: PROFIBUS-MPI parameters

Note:
The figure above shows the dialog in its initial state, when all values are adjusted to their default values. The fields grayed out in this dialog will open for input only after having chosen a customized value instead of the auto-detect entry from the **Baud Rate** drop-down list.

➢ In the **Station Address** field, enter the PROFIBUS-MPI address of the netLINK SCADA device at the PROFIBUS.

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The subsequent table describes the parameter in detail:

Parameter	Description	Range of Values/Value
Station Address	PROFIBUS MPI Address of the device.	0 … 126, Default: 1
Baud Rate	PROFIBUS MPI Baud Rate Indicates the velocity of transmission: Number of bits per second. **Important:** The setting of the **Baud Rate** is mandatory ! The `Auto-Detect` option is only possible if the communication is initiated by another bus participant.	9,6 kBit/s, 19,2 kBit/s, 31,25 kBit/s, 45,45 kBit/s, 93,75 kBit/s, 187,5 kBit/s, 500 kBit/s, 1,5 MBit/s, 3 MBit/s, 6 MBit/s, 12 MBit/s, Auto-Detect, Default: 187,5 kBit/s
Slot Time	Slot Time (T_{SL}) 'Wait for receipt' monitoring time of the senders (Requestor) of telegram for the acknowledgement of the recipient (Responder). After expiration, a retry occurs in accordance with the value of 'Max. telegram retries'	37 ... 16383 tBit, Default: 415 tBit
Min. Station Delay Responder	Minimum Station Delay of Responders (min T_{SDR}), This is the shortest time period that must elapse before a remote recipient (Responder) may send an acknowledgement of a received query telegram. The shortest time period between receipt of the last Bit of a telegram to the sending of the first Bit of a following telegram.	1 ... 1023 tBit, Default: 60 tBit
Max. Station Delay Responder	Maximum Station Delay of Responders (max T_{SDR}) This is the longest time period that must elapse before a Sender (Requestor) may send a further query telegram. Greatest time period between receipt of the last Bit of a telegram to the sending of the first Bit of a following telegram. The Sender (Requestor, Master) must wait at least for this time period after the sending of an unacknowledged telegram (e.g. Broadcast only) before a new telegram is sent.	1 ... 1023 tBit, Default: 400 tBit
Quiet Time	Quiet Time (T_{QUI}) This is the time delay that occurs for modulators (Modulator-trip time) and Repeaters (Repeater-switch time) for the change over from sending to receiving.	0 ... 127 tBit, Default: 1 tBit
Setup Time	Setup Time (T_{SET}) Minimum period “reaction time” between the receipt of an acknowledgement to the sending of a new query telegram (Reaction) by the Sender (Requestor).	1 … 255 tBit, Default: 1 tBit
Target Rotation Time	Target Rotation Time (T_{TR}) Pre-set nominal Token cycling time within the Sender authorization (Token) will cycle around the ring. How much time the Master still has available for sending data telegrams to the Slaves is dependent on the difference between the nominal and the actual token cycling time.	≥ 255 tBit, Default: 10000 tBit
GAP Actualization Factor	GAP Actualization Factor (G) Factor for determining after how many Token cycles an added participant is accepted into the Token ring. After expiry of the time period G*TTR, the Station searches to see whether a further participant wishes to be accepted into the logical ring.	1 … 255, Default: 20
Highest Station Address	Highest Station Address (H_{SA}) Station address of the highest active (Master) station.	1 … 126, Default: 31
Max. Retry Limit	Max number of telegram retries (Max_Retry_Limit) Maximum number of repetitions allowed for reaching a station.	1 ... 8, Default: 1

Table 20: Parameters PROFIBUS MPI

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Note:
Please note the following about **Bit times**: All times for the Bus parameters are given in Bit times. The Bit time `tBit` is the result of the reciprocal of the Baud rate: tBit = 1 / Baud rate (Baud rate in Bit/s)
The conversion from milliseconds into a Bit time is shown in the following formula:
Bit time = Time [milliseconds] * Baud rate.

➢ Click **OK** to save the set parameters.

or

➢ Click **Cancel** to reject the settings.

or

➢ Click **Default** to restore the preset default settings.

8.4.5 Acquiring data points (signals) from the STEP 7 project

This section describes the selection of those signals, which shall be accessed and visualized by atvise.

For this, you first have to select the STEP 7 project (see section *Selecting STEP 7 project file* [page 48]), from which the available signals should be acquired.

Important:
STRING and ARRAY data types of the STEP 7 program cannot be processed. The data type STRUCT is only supported if it does not contain STRING and ARRAY data types. For more on allowed data types, please refer to section *STEP 7 data type support of the Symbolizer* [page 59].

Note:
If you don't have a STEP 7 file at your disposal and/or want to define all data points yourself, you will find an empty STEP 7 project file on the netSCADA DVD in the `Supplements & Examples \Example Projects\Symbolless, empty STEP7 Project` folder.

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In order to acquire the signals, proceed as follows:

➢ In the project tree of the atvise builder, select the netLINK SCADA devise which you have configured as your webMI Server (see section *Configuring netLINK SCADA device* [page 45]), then use the right mouse button to open the context menu and choose **Acquire Datapoints**.

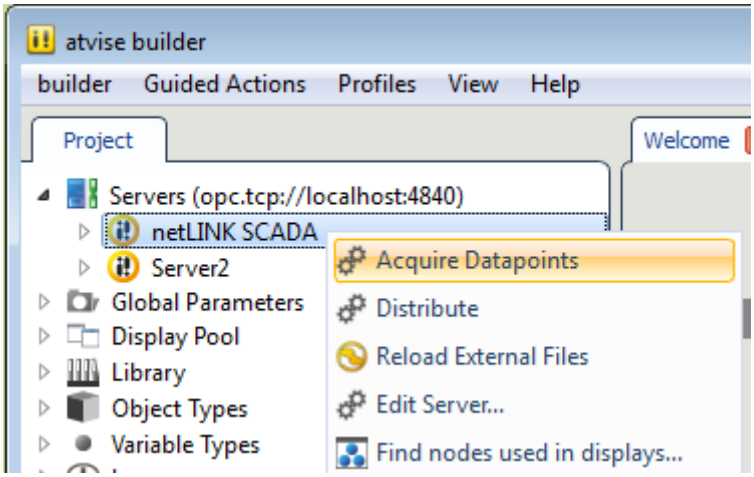

Figure 29: Acquire data points

Or:

➢ As an alternative, you can choose **Guided Actions** > **Import all variables** from the menu bar of the atvise builder and then select the the netLINK SCADA device which you have configured as your webMI Server.

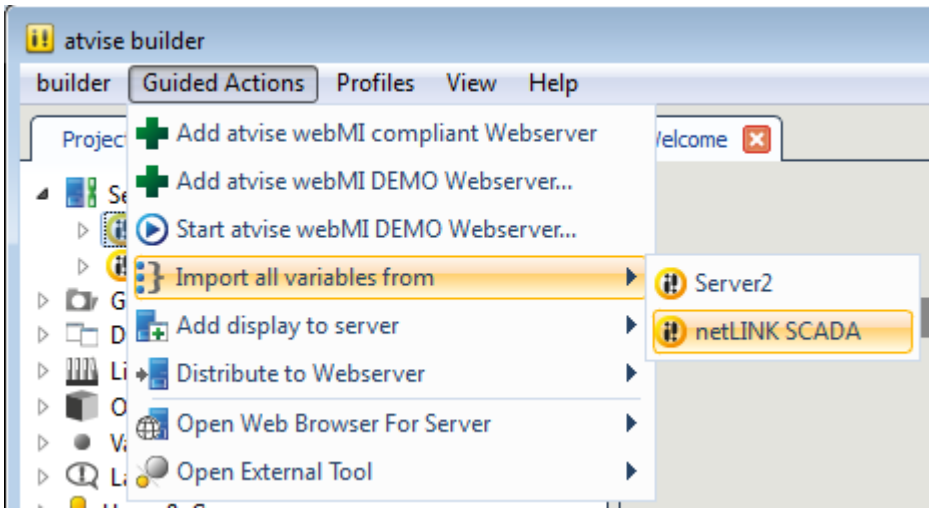

Figure 30: Import variables from netLINK SCADA

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➢ The dialog window of the **Symbolizer** opens:

Note:
The Symbolizer allows to select a subset of the data points, which later shall be available for the generation of the visualization.

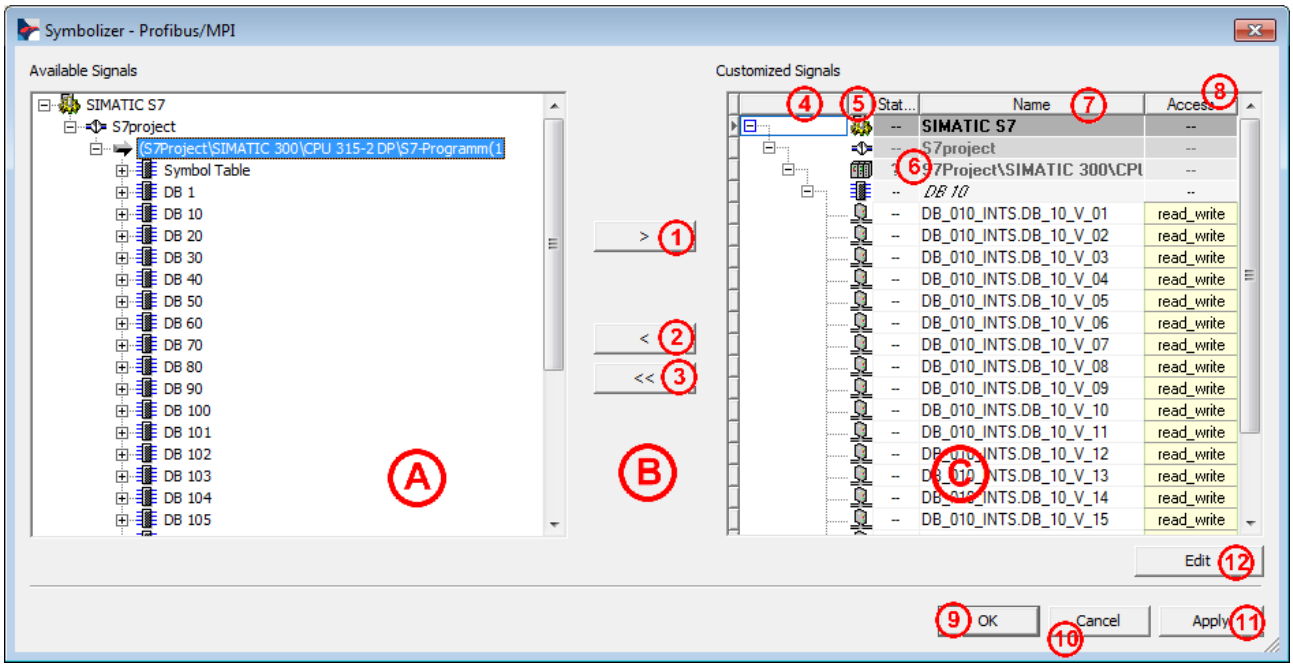

Figure 31: GUI of the Symbolizer

Important:
Reading in the signals from the STEP 7 project happens exactly once. If this dialog is opened more than once, the Symbolizer always works with a copy of the signal list.
If you want to extend the STEP 7 project and add further signals later on, which shall be available in your atvise project, then you must either select the project again (as described in section *Selecting STEP 7 project file* [▶ page 48]) or the new signals must be manually configured in the Signal Editor of the Symbolizer.

- The tree in the **Available Signals** area Ⓐ lists all data blocks or symbols which have been read-in from the STEP 7 S7 Projekt.
- The tree in the **Customized Signals** area Ⓒ lists the selected variables to be included in atvise.

Note:
The GUI of the Symbolizer can be enlarged by pulling the lower right corner.

➢ Transfer those signals to be accessed by atvise from area Ⓐ to area Ⓒ Use the buttons described below.

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The three arrow buttons in the center (area Ⓑ) can be used as follows:

- By using the **>** button ① you can add STEP 7 variables/data blocks to the **Customized Signals** list of STEP 7 variables which shall be accessible by atvise.
- If you want to exclude an already selected variable from the **Customized Signals** list, click on it in the right list field and then click **<** button ②.
- If you want to exclude all variables at once from **Customized Signals** list, click **<<** button ③.

The **Customized Signals** (area Ⓒ) features the following elements:

- The tree structure ④ containing control elements for expanding or compressing items.
- A column featuring icons ⑤.
- The **Station Address** column ⑥.
  The address of the S7 component is tagged with a question mark as long as no bus address has been configured. Configuring the bus address is mandatory, otherwise the dialog cannot be left with **OK**!

Note:

Double-clicking in the marked area on position ⑥ opens the **Signal Editor**, allowing you to set the bus address of the PLC and perform other signal settings (see section *Configuring signals in the Signal Editor* [page 56]).

- The **Name** column ⑦ featuring the name of the SIMATIC S7 data block or symbol (as defined in the STEP 7 project).
- The **Access** column ⑧.
  The **Access** parameter defines the **read**, **write** or **read and write** access to the signal.

Position	Button	Description
⑨	**OK**	Stores the settings and closes the Symbolizer.
⑩	**Cancel**	Closes the Symbolizer without storing the settings.
⑪	**Apply**	Stores the settings without closing the Symbolizer.
⑫	**Edit**	Opens the **Signal Editor**.

Table 21: Further control elements of the Symbolizer

➢ After selecting and editing the signals, click **OK** ⑨ button, in order to make the Customized Signals available for the atvise builder and the visualization.

⇨ You have imported the data points from the STEP 7 project. The signals are now available for designing your displays. Proceed to section *Creating the visualization (designing the displays)* [page 70].

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8.4.6 Configuring signals in the Signal Editor

In the **Signal Editor**, the available signals are displayed hierarchically within a tree structure. The editor allows changing parameters for available signals, to erase these and to create new signals manually.

To open the Signal Editor, click **Edit** button in the Symbolizer or double-click the question mark in the **Station Address** (see positions 12 and 6 in section *Acquiring data points (signals) from the STEP 7 project* [page 52]).

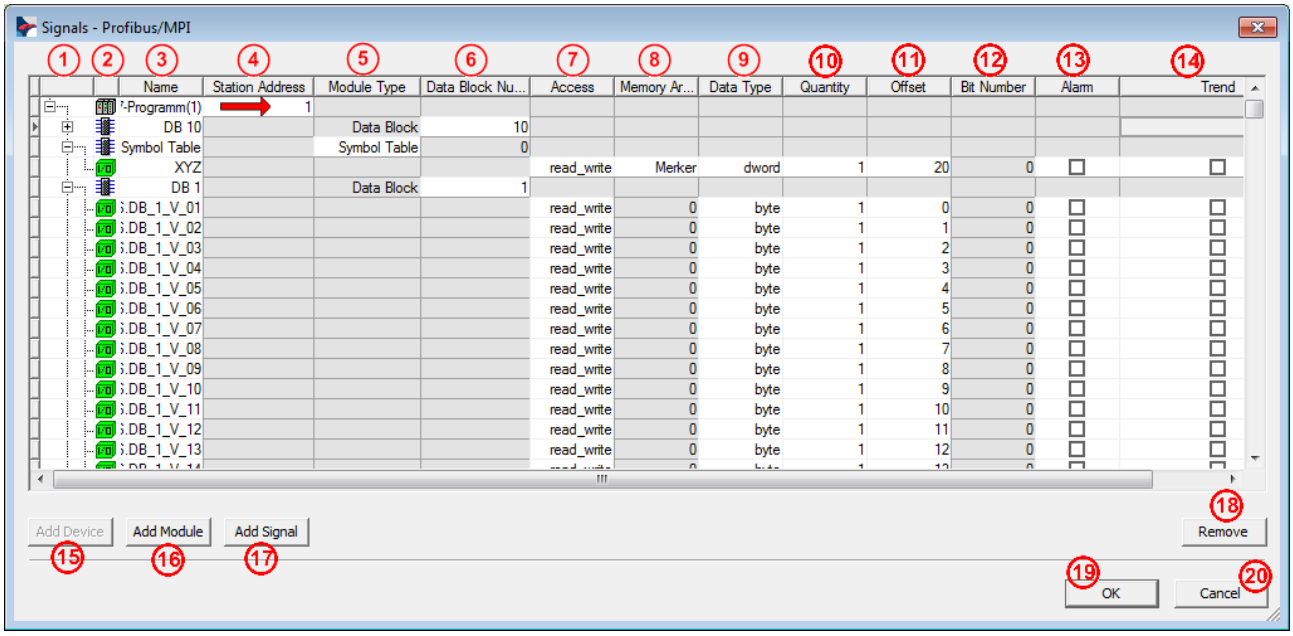

Figure 32: Signal Editor

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Position	Column	Description
①	-	This column features the tree structure of the devices, modules and signals.
②	-	This column features symbols for distinguishing between devices , modules and signals .
③	**Name**	Name of the STEP 7 program, symbol table or signal.
④	**Station Address**	**Note**: The Station Address is the PROFIBUS-MPI address of the S7 component on the bus which is to be visualized. It can not be extracted out of the STEP 7 project. The value is automatically adjusted to the value 1 when opening the Symbolizer for the first time, but must be adjusted to the correct value. Otherwise, no communication will take place between the netSCADA device and the S7 component.
⑤	**Module Type**	A symbol from the Symbol Table or the Data Blocks.
⑥	**Data Block**	Number of data block.
⑦	**Access**	Permitted **Access**: read, write, read_write
⑧	**Data Area**	Memory area
⑨	**Data Type**	(concerns only signals)
⑩	**Quantity**	Number of data elements
⑪	**Offset**	Offset within the memory area
⑫	**Bit Number**	(if necessary)
⑬	**Alarm**	**Alarm**. If checked, this signal is enabled for alarm supervision and will permanently be supervised by the netSCADA device. For further information, see section *Configuring alarms* [▷ page 77].
⑭	**Trend**	**Trend**: If checked, the values of the signal are permanently read and recorded by the netSCADA device in the trend buffer. For further information, see section *Configuring trending* [▷ page 80].

Table 22: Columns in Signal Editor

Position	Button	Description
⑮	**Add Device**	Adds a new signal device (S7), when no device exists in the Signal Editor. The button is grayed out, when a device exists in the Signal Editor.
⑯	**Add Module**	Adds a new data module.
⑰	**Add Signal**	Adds a new signal within the selected data module.
⑱	**Remove**	Deletes the tagged signal object.
⑲	**OK**	Stores the settings and closes the Signal Editor.
⑳	**Cancel**	Closes the Signal Editor without storing the settings.

Table 23: Control elements in the Signal Editor

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Important:

All changes made in this window will be lost, if you import a STEP 7 project by using the method described in the section *Selecting STEP 7 project file* [page 48].

However, these changes will not be lost, if the dialog for the import of data points of the same S7 project is invoked in the way described in section *Acquiring data points (signals) from the STEP 7 project* [page 52].

➢ After having configured all signals to be visualized, click **OK** button to exit the Signal Editor and to take over the signals into your project.

➢ In the project tree of the atvise builder, the signals which have been taken over are displayed in the OBJECTS folder:

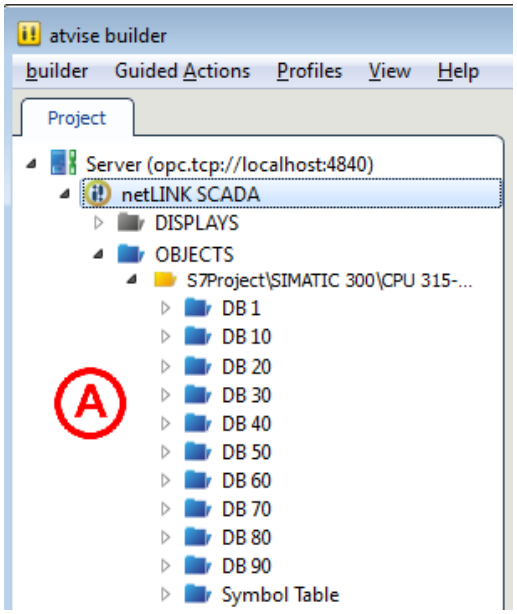

Figure 33: Signals in project tree

⇨ In area Ⓐ, the references to the data blocks of the imported PLC program can be seen. These signals are now available for your visualization project.

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8.4.7 STEP 7 data type support of the Symbolizer

Simple STEP 7 data types

The following simple STEP 7 data types are supported by the Symbolizer:

Data type	Description	Allowed range of values Lower limit	Allowed range of values Upper limit	Supported by Symbolizer
BOOL	Data type for Boolean values. These data are stored each in a single bit. The allowed range of values only contains the values TRUE and FALSE	FALSE	TRUE	Yes
BYTE	Unsigned 8 bit integer data type	0	255	Yes
WORD	Unsigned 16 bit integer data type	0	65535	Yes
INT	Signed 16 bit integer data type	-32768	32767	Yes
DWORD	Unsigned 32 bit integer data type	0	2^{32}-1	Yes
DINT	Signed 32 bit integer data type	-2^{31}	2^{31}-1	Yes
REAL	Signed 32 bit real data type with exponential representation	+/-1.175495e-38	+/-3.402823e+38	Yes
CHAR	8 bit character data type for storing ASCII characters such as ‘a’, ‘b’ and so on. Internal processing as being of type BYTE.	All ASCII characters allowed		Yes
S5TIME	Unsigned 16 bit data type for storage of the S7-internal time in steps of 10 milliseconds. Internal processing as being of type WORD.	Valid time		Yes
DATE	Unsigned 16 bit data type for storage of the IEC-time in steps of 1 day. Internal processing as being of type WORD.	Valid date		Yes
TIME	Signed 32 bit data type for storage of the IEC-time in steps of 1 millisecond. Internal processing as being of type DWORD.	Valid time		Yes
TIME_OF_DAY	32 bit data type for storage of the clock time in steps of 1 millisecond. Internal processing as being of type DWORD.	Valid time of day		Yes

Table 24: Simple STEP 7 data types

Structured STEP 7 data types

The following structured STEP 7 datatype is only supported by the Symbolizer if it does not contain any ARRAY or STRING elements:

- STRUCT

This is a data type for structures of multiple elements consisting of usually different data types.

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The following structured STEP 7 datatypes are not supported by the Symbolizer at all:

- ARRAY

This is a data type for a field, i.e. a group of elements of the same type.

- STRING

This is a data type for strings, i.e. concatenated characters.

User defined data types and other data types not mentioned here are not supported by the Symbolizer.
As an alternative, the data type `Byte` can be used.

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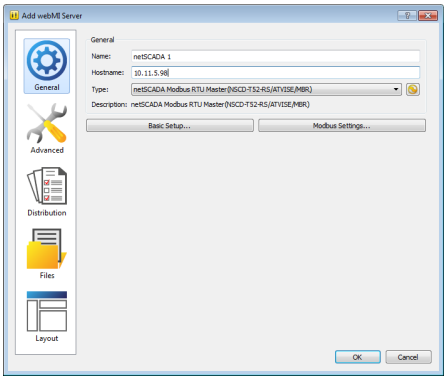
8.5 Creating project for NSCD-T52-RS/ATVISE/MBR (netSCADA for Modbus)

8.5.1 Overview of the necessary steps

To create a visualization project for your NSCD-T52-RS/ATVISE/MBR device, you need to perform the following steps:

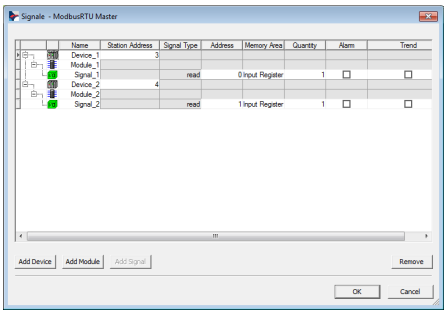
Configure netSCADA

1. Enter a name
2. Under **Hostname**, enter die IP address of the netSCADA device
3. Under **Type** select netSCADA device (**Modbus RTU Master [NSCD-T52-RS/ATVISE/MBR]** or **Modbus RTU Slave [NSCD-T52-RS/ATVISE/MBR]** entry)
4. Assign temporary IP address (Basic Settings…)
5. Configure Modbus Settings



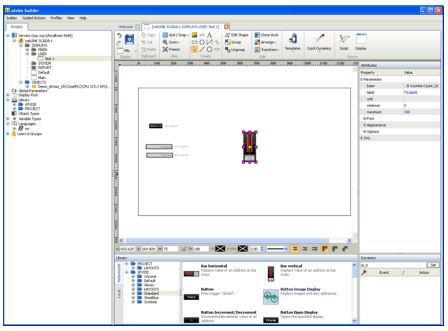
Select signals in Signal Editor

1. Select Modbus node
2. Select signals and configure parameters
3. Add alarm for signal, if necessary
4. Select trending function for signal, if necessary



Create displays and link display elements to data points

1. Select and place display elements
2. Link data points
3. Layout display



Generate (compile) displays (i. e. visualization web pages) and transfer them to the netSCADA

Show generated displays (i. e. visualization web pages) in web browser

1. Connect to start page
2. Show web pages in browser

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8.5.2 Configuring netSCADA device

A netSCADA-Gerät is administered within atvise as **webMI Server**. In order to select and configure the NSCD-T52-RS/ATVISE/MBR as webMI Server, proceed as follows:

1. Open **webMI Server** configuration dialog window.

Note:
As long as you haven't added a **WebMI Server** yet, the **Add webMI Server** dialog window opens automatically on every start-up of the atvise builder.

➢ In the project tree of the atvise builder, select **Servers** entry. Then use the right mouse button to open the context menu and choose **Add Server…** > **WebMI**.

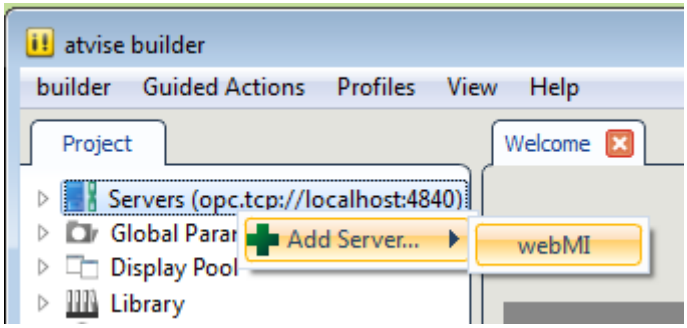

Figure 34: Add Server

Or:

➢ As an alternative, you can choose **Guided Actions** > **Add atvise webMI compliant Webserver** from the menu bar of the atvise builder.

Note:
If you have already added a "provisional" webMI Server (for example on first starting up the atvise builder software), which hasn't been properly configured yet, you can re-open the webMI Server dialog for this provisional webMI Server by selecting the entry for this server in the project tree and then choosing **Edit Server…** from the context menu. You can then complete the configuration of this provisional webMI Server in the opened **Edit webMI Server** dialog window.

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➮ The Add **webMI Server** (respectively the **Edit webMI Server**) dialog window opens with the **General** tab:

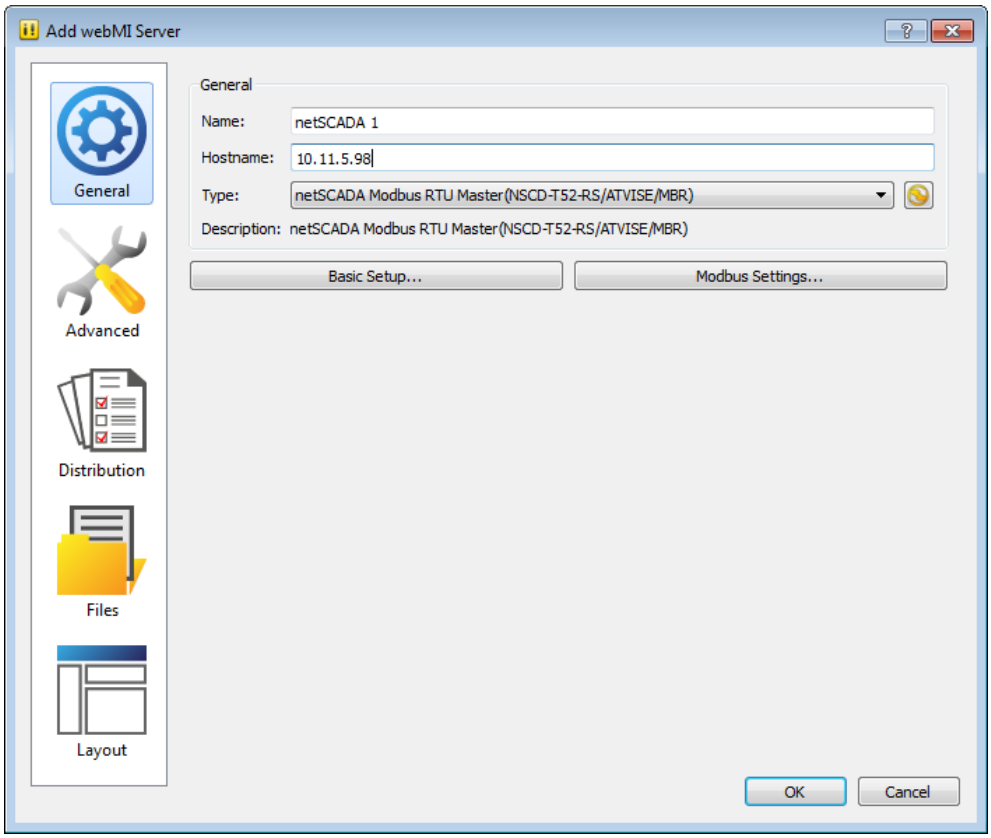

Figure 35: webMI Server Dialog

2. Enter basic parameters.
   - ➢ In the **Name** field, enter a name for your server (i. e. the netSCADA device).
   - ➢ In the **Hostname** field, enter the IP address (e.g. 10.11.5.98) for your server (i. e. the netSCADA device).
   - ➢ In the **Type** drop-down list, select **netSCADA Modbus RTU Master (NSCD-T52-RS/ATVISE/MBR)** or **netSCADA Modbus RTU Slave [NSCD-T52-RS/ATVISE/MBR]** entry), depending on whether you intend to use the device as master or slave.
3. Assign temporary IP address.
   - ➢ Click **Basic Settings…** button to open the **LAN Scanner and Configuration Tool**, which is a tool for assigning temporary IP addresses. For details, see section *Assigning temporary IP address* [page 41].
4. Configure MODBUS parameters.
   - ➢ Click **Modbus Settings…** button to open a dialog in which you can configure the MODBUS settings of the netSCADA device. For details, see section *Configuring Modbus RTU parameters* [page 64].

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Note:
In the **Layout** tab, you can choose a pre-defined standard layout for the visualization which you are going to create.

5. Save webMI Server.
   - ➢ After having configured the webMI Server, click **OK** button, to save the parameters of the webMI Server and to close the dialog window.
   - ⇨ You have configured the netSCADA device as webMI Server.

Note:
If you want to re-open this configuration dialog window later, double-click the server entry in the project tree of the atvise builder. The re-opened configuration dialog window is then called **Edit webMI Server** and not **Add webMI Server** like before.

8.5.3 Configuring Modbus RTU parameters

The MODBUS communication parameter can be configured in the **Modbus RTU** dialog window.

- ➢ In the **Add webMI Server** (respectively **Edit webMI Server**) dialog window, click **Modbus Settings…** button (see section *Configuring netSCADA device* [page 62]).
- ➢ The **Modbus RTU** dialog window opens:

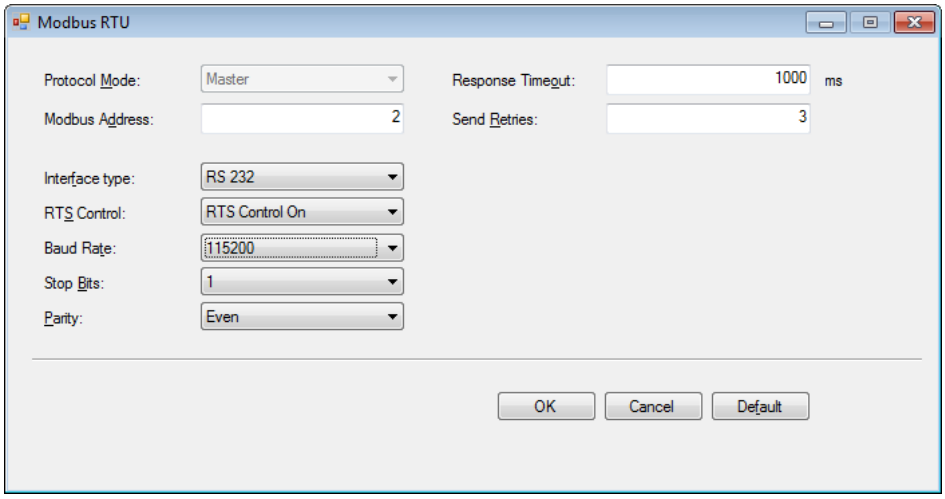

Figure 36: Modbus parameter dialog for master device

- ➢ Set the parameters according to the configuration of your Modbus network.

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The subsequent table describes the parameters in detail:

Parameter	Description	Range of Values/ Value
Protocol Mode	Determines the role of the device as master or slave within the Modbus. This field is preset according to the device type which you have chosen in the **webMI Server** dialog window.	Master Slave
Response Timeout	Timeout value in milliseconds. Defines the maximum waiting time of the master for an answer from the slave. Can only be selected if **Protocol Mode** is set to **Master**.	10 … 10000 ms *Default: 1000 ms*
Modbus Address	Defines the address of the netSCADA device in the Modbus.	1 ... 247 *Default: 2*
Send Retries	Defines the number of telegram retries when the connection is interrupted or other transmission errors occur. Can only be selected if **Protocol Mode** is set to **Master**.	0 … 10 *Default: 3*
Interface type	Serial interface type to be used by the netSCADA device in the Modbus.	RS 232 RS 485 RS 422
RTS Control	Signal „Request To Send“ can be switched on or off. Can only be selected if **Interface type** is set to **RS 232**.	RTS Control Off RTS Control On *Default: Off*
Baud Rate	Modbus RTU network Baud rate in Bits per second.	1200 2400 4800 9600 19200 38400 57600 115200 *Default: 9600*
Stop Bits	Defines the quantity of stop bits to be used in protocol for serial data communication.	1 2 *Default: 1*
Parity	Defines the parity bit for serial data communication.	None Even Odd *Default: Even*

Table 25: Parameters Modbus RTU

- Click **OK** to save the set parameters.

or

- Click **Cancel** to reject the settings.

or

- Click **Default** to restore the preset default settings.

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8.5.4 Selecting signals in Signal Editor

This section describes how to select the signals you want to visualize.

1. Open Signal Editor.

➢ In the project tree of the atvise builder, select the netSCADA devise which you have configured as your webMI Server (see section *Configuring netSCADA device* [page 62]), then use the right mouse button to open the context menu and choose **Acquire Datapoints**.

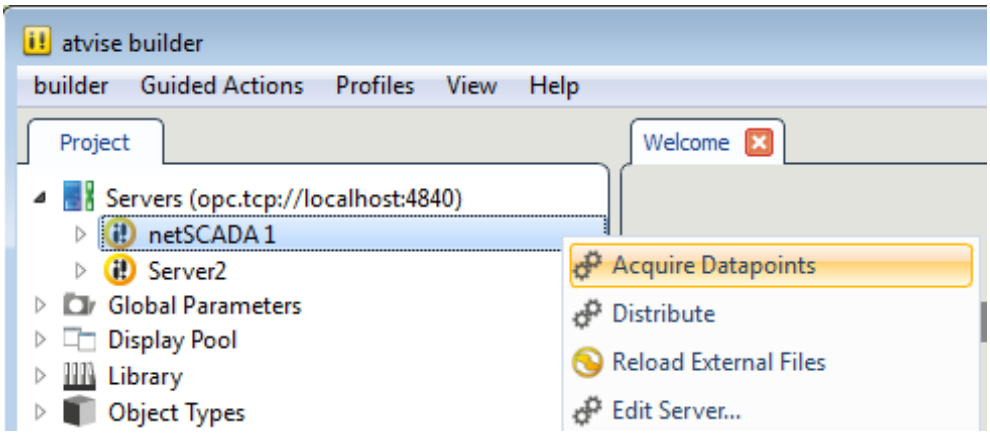

Figure 37: Acquire data points

Or:

➢ As an alternative, you can choose **Guided Actions** > **Import all variables** from the menu bar of the atvise builder and then select the the netSCADA device which you have configured as your webMI Server.

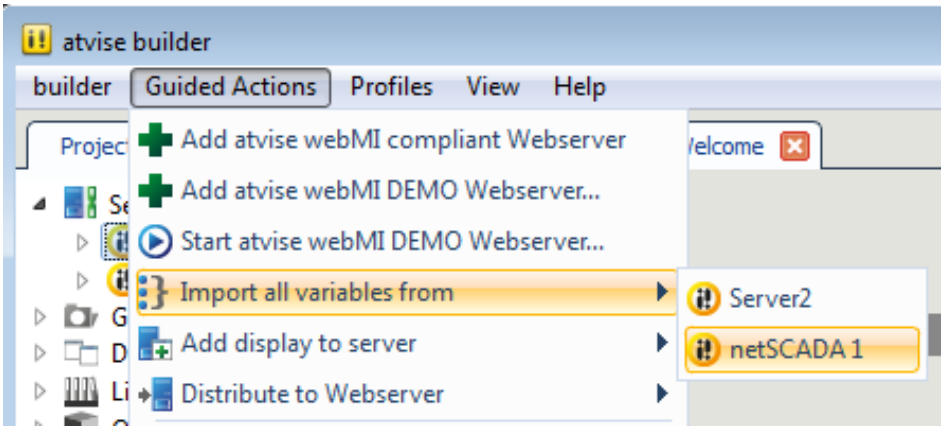

Figure 38: Open Signal Editor

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➮ The Signal Editor opens:

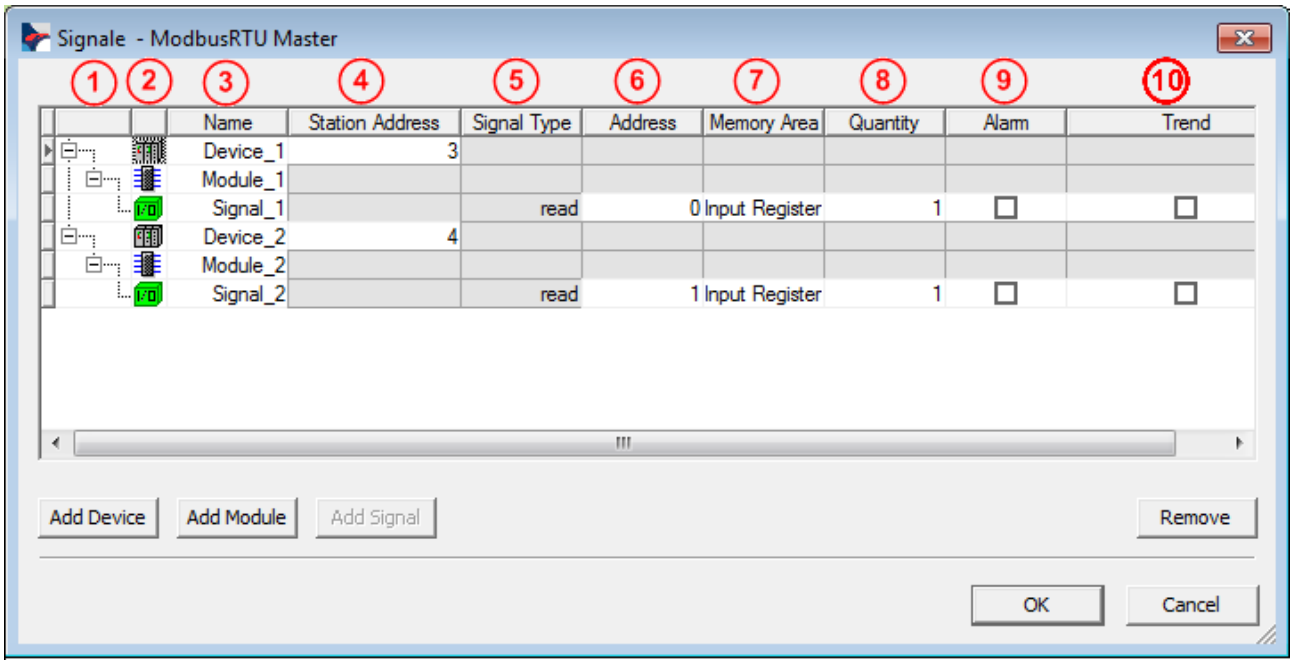

Figure 39: Signal Editor Modbus RTU Master

2. Configure the signals which you want to visualize.
   - ➢ Click **Add Device** button, to add a Modbus node containing the signals which you want to visualize.
   - ➢ In the **Station Address** field, enter the station address of the Modbus node.
   - ➢ Click **Add Module** button to add a module (i. e. structuring element) to the Modbus node, if necessary.
   - ➢ Click **Add Signal** button, to add a signal which you want to visualize.
   - ➢ Then proceed to configure the **Address**, **Memory Area** and **Quantity** parameters of the signal which you want to visualize. If you want to use the **Alarm** (alarm surveillance) or **Trend** (trend recording) functions with that signal, activate the corresponding check box.

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The Signal Editor features the following elements:

Position	Column	Description
①	-	This column features the tree structure of the Modbus nodes, modules and signals.
②	-	This column features symbols for distinguishing between Modbus nodes (devices) , modules and signals .
③	**Name**	Name of the Modbus node, module or signal. This field can be edited.
④	**Station Address**	Address of the Modbus node. This field can be edited.
⑤	**Signal Type**	Signal types: read access (**read**), write access (**write**), read and write access (**read_write**). Depends on the selected **Memory Area.**
⑥	**Address**	Address of the signal to be visualized (relative register or bit position within the selected **Memory Area**). This field can be edited.
⑦	**Memory Area**	Memory area of the signal to be visualized: **Discrete Input** (single bit, read-only) **Coils** (single bit, read/write) **Input Register** (16-bit word, read-only) **Holding Register** (16-bit word, read/write)
⑧	**Quantity**	Quantity of data elements. Depends on the selected **Memory Area.**
⑨	**Alarm**	**Alarm**. If checked, this signal is enabled for alarm supervision and will permanently be supervised by the netSCADA device. For further information, see section *Configuring alarms* [▷ page 77].
⑩	**Trend**	**Trend**: If checked, the values of the signal are permanently read and recorded by the netSCADA device in the trend buffer. For further information, see section *Configuring trending* [▷ page 80].

Table 26: Columns in Signal Editor

Button	Description
Add Device	Adds a new Modbus node.
Add Module	Adds a new module.
Add Signal	Adds a new signal within the selected data module.
Remove	Deletes a selected item.
OK	Closes the Signal Editor and takes over the signals into your project.
Cancel	Closes the Signal Editor without taking over the signals.

Table 27: Control elements in the Signal Editor

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3. Store signals.

   ➢ After having configured all signals to be visualized, click **OK** button to exit the Signal Editor and to take over the signals into your project.

   ⇘ In the project tree of the atvise builder, the signals which have been taken over are displayed in the OBJECTS folder:

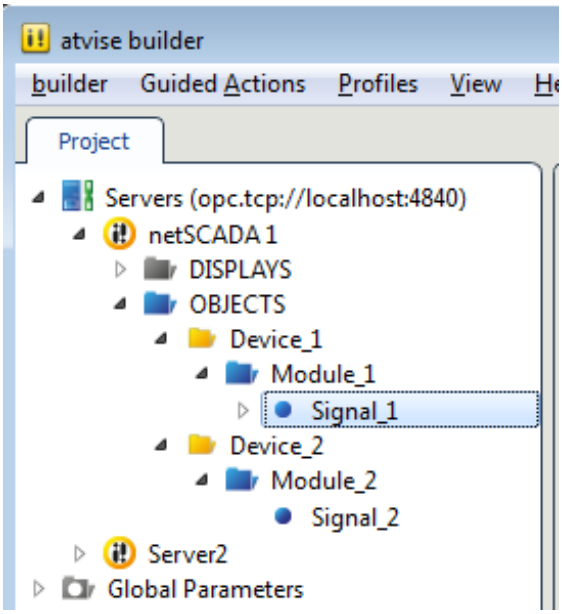

Figure 40: Signals in project tree

   ⇨ These signals are now available for your visualization project.

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8.6 Creating the visualization (designing the displays)

8.6.1 Overview

This section describes how to use the display editor of the atvise builder to design the web pages of your visualization project, which later will be running in the netSCADA device. This design process involves the selection and positioning of ready-made display elements according to your ideas and requirements. It also involves the assignment of the signals/data points which are to be visualized and which are provided by the S7 respectively the Modbus nodes connected to the netSCADA device.

8.6.2 Default displays

An atvise display is a unit that will later be turned into a visualization web page.

Each visualization project can contain several displays/web pages. Displays are stored in the project tree of the atvise builder in the **DISPLAY** folder below your netSCADA project (i. e. below the netSCADA configured as webMI server):

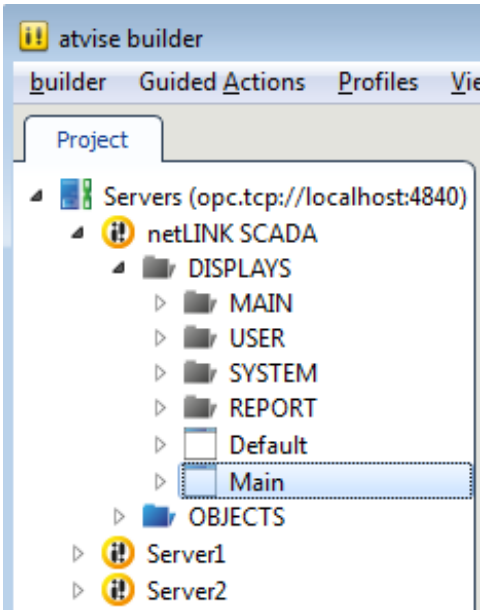

Figure 41: Main Display

Each newly added webMI server automatically contains four folders for storing new displays. It also contains a **Default** template and a display called **Main**. Please note, that the **Main** display is the mandatory start page of your visualization project. After having downloaded the project to your device, the **Main** display will always be the first page that opens when you connect to the device via Ethernet IP. Thus, the **Main** display is always used as start page of the visualization.

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8.6.3 Creating displays

To create a new display, proceed as follows:

- In the project tree of the atvise builder, select the **DISPLAYS** folder (if you want to store the new display on the first level of the DISPLAYS folder), or select one of the subordinate DISPLAYS folders in which you want to store the new display.
- Then use the right mouse button to open the context menu and choose **Add Display…**

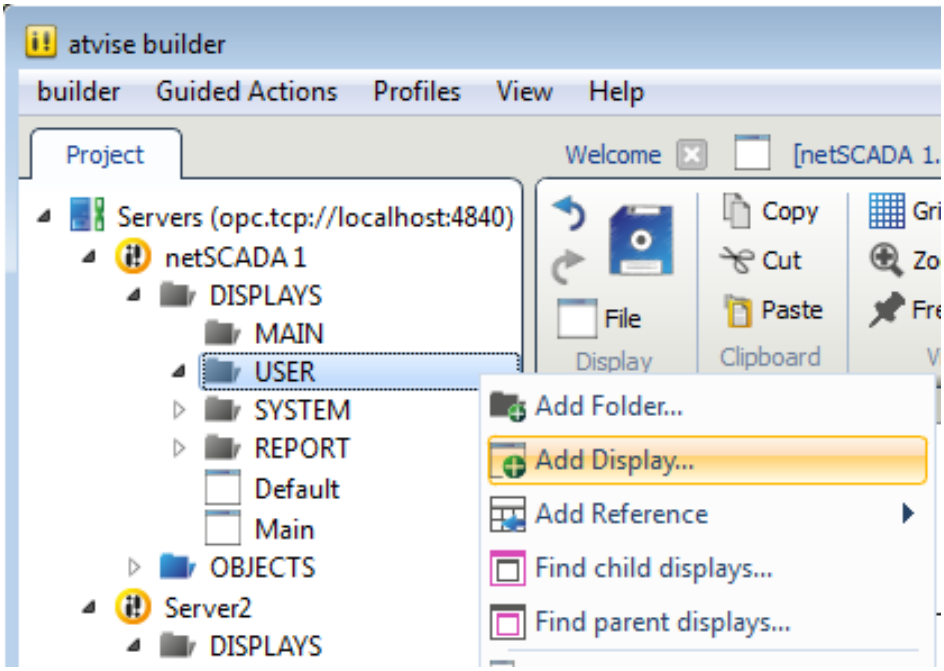

Figure 42: Create new graphic display

The **Name of Display** dialog opens:

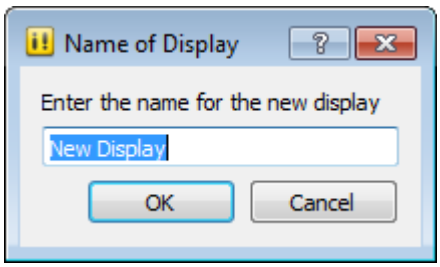

Figure 43: Name of display dialog

- Enter a name for your display, e. g. „*Display 1*“, then click **OK** button.

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The new display has been added to the project tree:

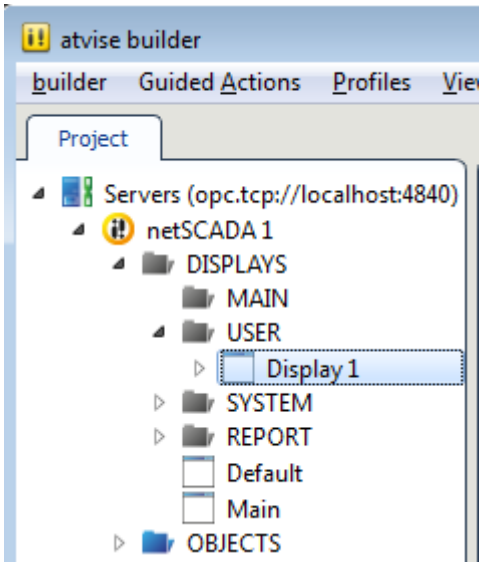

Figure 44: New display in project tree

➢ To fill your display with content, double-click the display entry in the project tree.

⇨ The display editor of atvise opens. You can now begin to design your display.

Use the online help of the atvise builder for designing the display and for the assignment of user rights.

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8.6.4 GUI of the display editor

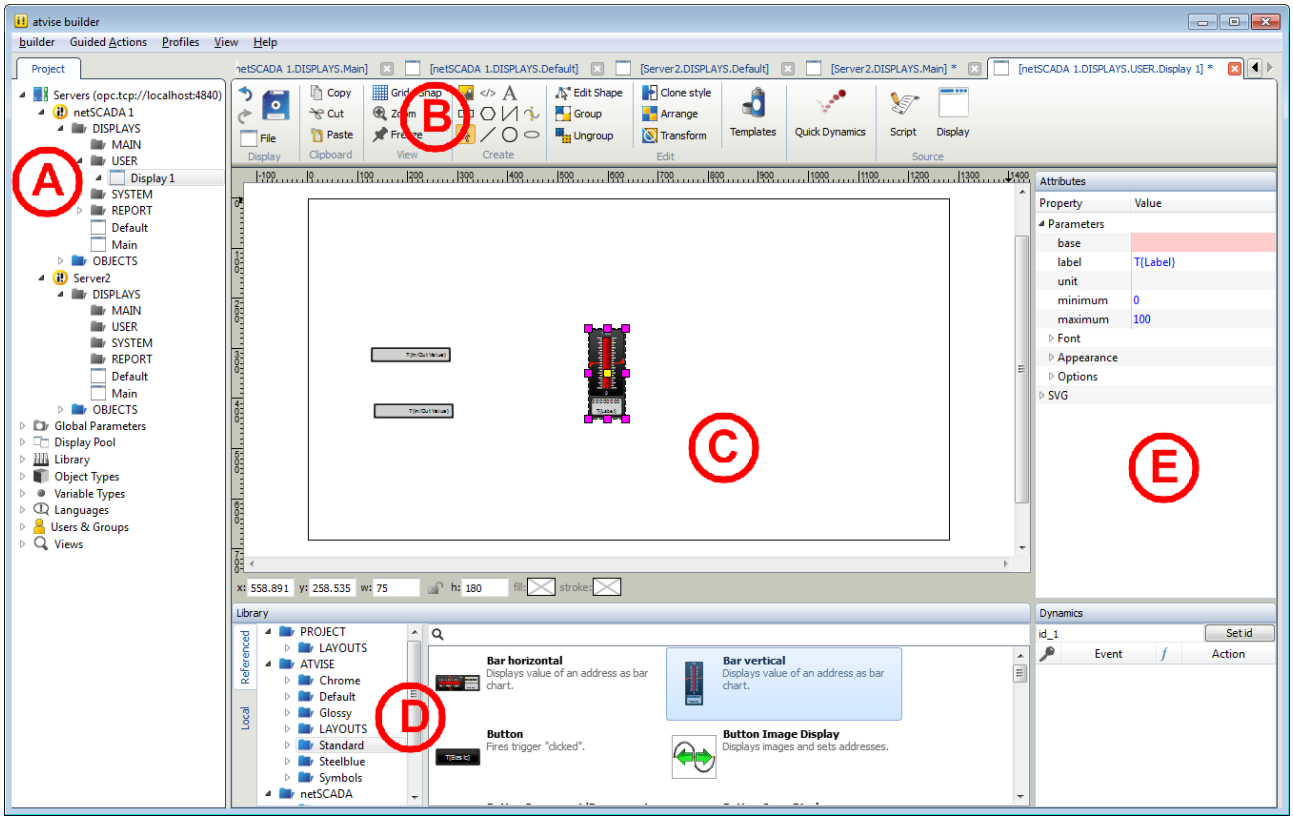

Figure 45: Graphics editor of atvise builder

The display (or graphics) editor is divided into five main areas:

- Ⓐ Project tree area
- Ⓑ Drawing tools area
- Ⓒ Drawings area
- Ⓓ **Library** (display elements area)
- Ⓔ **Attributes** area (properties of the selected display element)

The **Library** Ⓓ contains many ready-made display elements, which can be used instantly. The following types of elements are available:

- Analog controls
- Analog meters
- Default displays (designed for output and input of boolean, numeric and string data)
- Digital controls
- Digital indicators
- General displays

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8.6.5 Adding display elements and assigning signals

This section describes how to add an element to your display (e. g. for showing a simple value of a numeric input/output signal):

1. Select and place element.

   ➢ In the **Library** area (see position Ⓓ in section *GUI of the display editor* [page 73]) open the **ATVISE** > **Default** > **Number** folder.

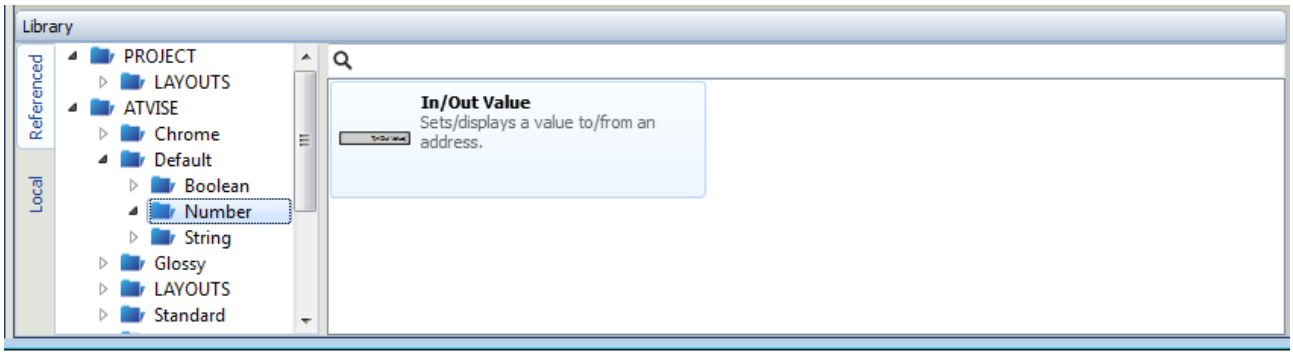

Figure 46: Select element

   ➢ Select the **In/Out Value** element and drag and drop into the drawing area. Place it onto the display at the intended position.

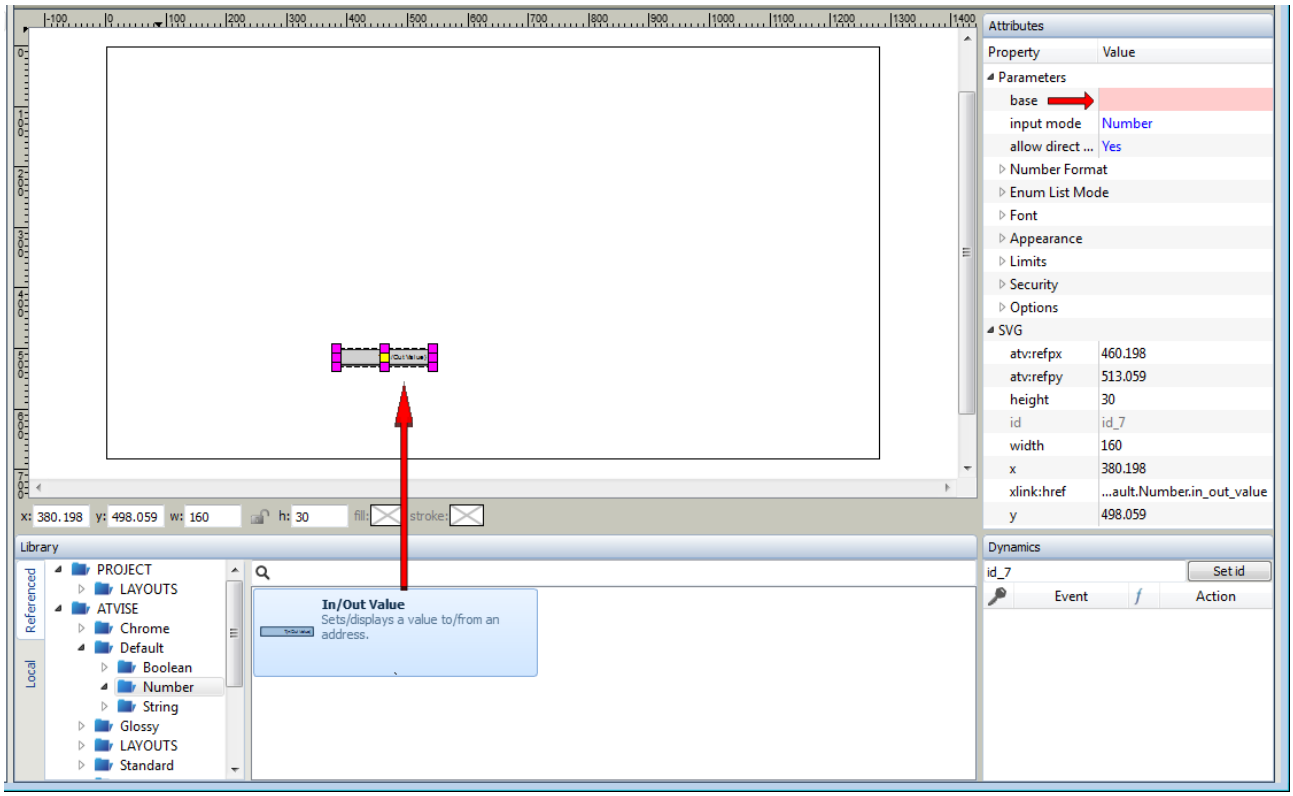

Figure 47: Drag and drop element onto the display

2. Assign a signal to the element.

   ➢ In the drawing area, select the **In/Out Value** element, then in the **Attributes** area, click the pink highlighted **Value** field next to the **Parameter** > **base** entry.

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➮ The **Value** field changes its appearance and shows a dotted control button:

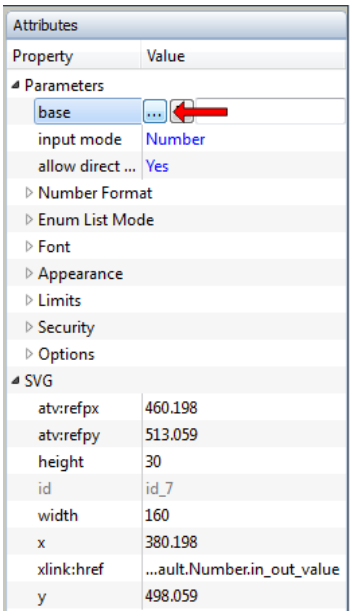

Figure 48: Assign attributes to element

➢ Click button to open the **Object Selector** dialog window, in which you can assign a signal to the element, so that this signal will be visualized by the element.

➮ The **Object Selector** dialog window opens:

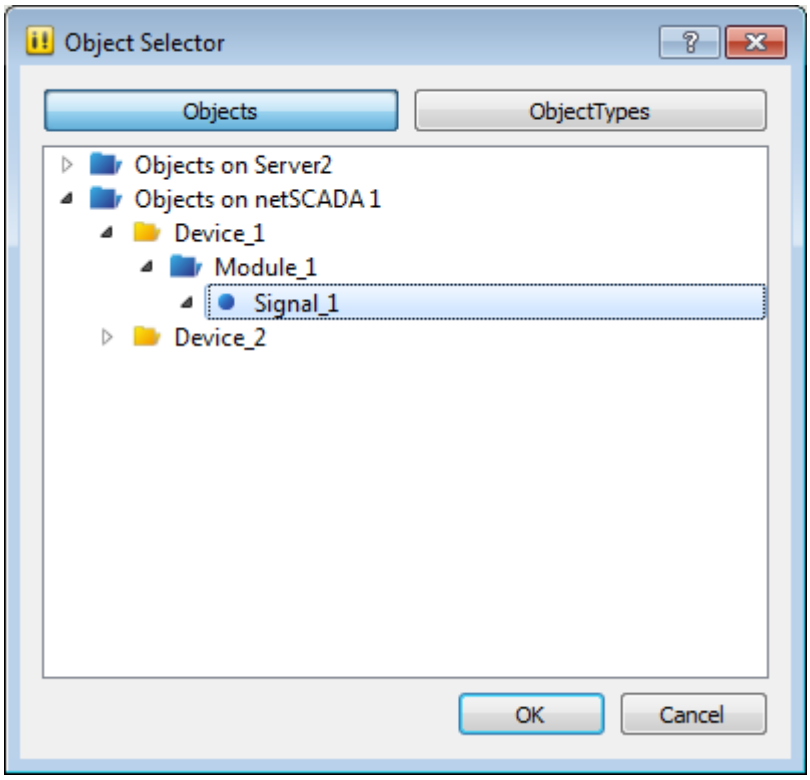

Figure 49: Assign signal to element

➢ Click **Objects** Button.

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A list featuring the signals from your project opens.

➢ Select the desired signal, then click **OK** button (as an alternative, you can double-click the signal).

The **Object Selector** dialog window closes. You have connected the signal to the display element.

You can now proceed to add, place and edit further display elements in the atvise builder and connect them to signals. When you are finished, save the display.

3. Save display.

➢ In the drawing tools area, click the floppy disk symbol:

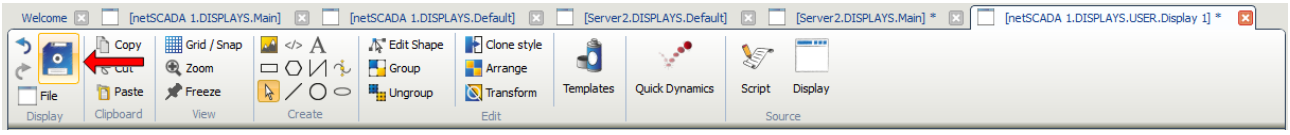

Figure 50: Save display in atvise builder

⇨ You have saved the display in your atvise project.

Note:
Please note, that by saving the display in the project, it has not yet been stored in the netSCADA device.

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8.7 Alarms and trending

8.7.1 Configuring alarms

General

netSCADA devices support the alarm functions of atvise. The signals/ variables to be surveilled by the alarm function can be selected in the **Signal Editor** (for netLINK SCADA see section *Configuring signals in the Signal Editor* [page 56], for netSCADA Modbus see *Selecting signals in Signal Editor* [page 66]). If you activate the check box in the **Alarm** column, the corresponding signal will be permanently supervised by the netSCADA device.

Activating and acknowledging alarms

An alarm is pending, if the signal has a value different than `0`. An alarm is not pending, if the signal has the value `0`.

At acknowledgment of an alarm signal, the netSCADA device can set another signal within the S7 component or the Modbus PLC automatically, in order to indicate the acknowledgment there. However, this signal must have the same name as the alarm signal, extended by `.AlarmAck`.

Example

An alarm signal has the name `OverFlow1`. Therefore, the corresponding automatic acknowledgment signal is named `OverFlow.AlarmAck`. If the alarm is acknowledged within the visualization, the visualization automatically writes the value `1` into the signal `OverFlow.AlarmAck`. You have to reset this value in the S7 component or Modbus PLC, in order that acknowledgment can take place once again.

For further information about the alarm functions in atvise, please consult the online help of the atvise builder.

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Define wording of alarm messages

To define the wording of alarm messages, proceed as follows:

1. Open **Alarm management**.
   - ➢ In the project tree of the atvise builder, double-click the element **Library** > **ATVISE** > **Quick Dynamics** > **Alarmmanagement**.
   - ➢ The **Alarm management** table opens:

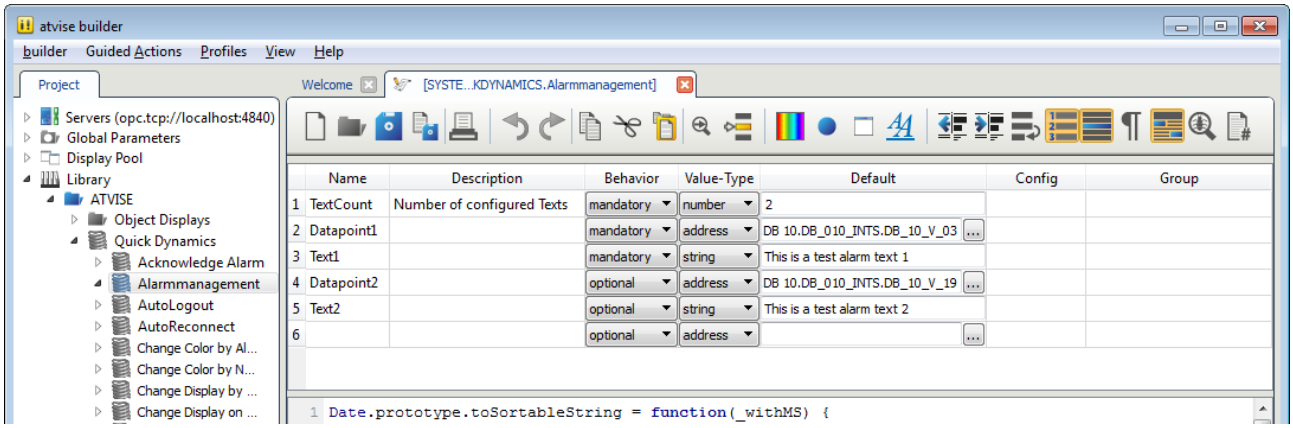

Figure 51: Alarm management

2. Specify total number of alarm messages.
   - ➢ In the **TextCount** line, check if the `number` type is selected in the **Value-Type** drop-drown list.
   - ➢ In the **Default** column of the **TextCount** line, enter the total number of alarm messages contained in the project.
3. Select signals/variables.
   - ➢ In the **Datapoint1** line, check if the `address` type is selected in the **Value-Type** drop-drown list.
   - ➢ In the **Default** column of the **Datapoint1** line click … button.

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➧ The **Object Selector** dialog window opens:

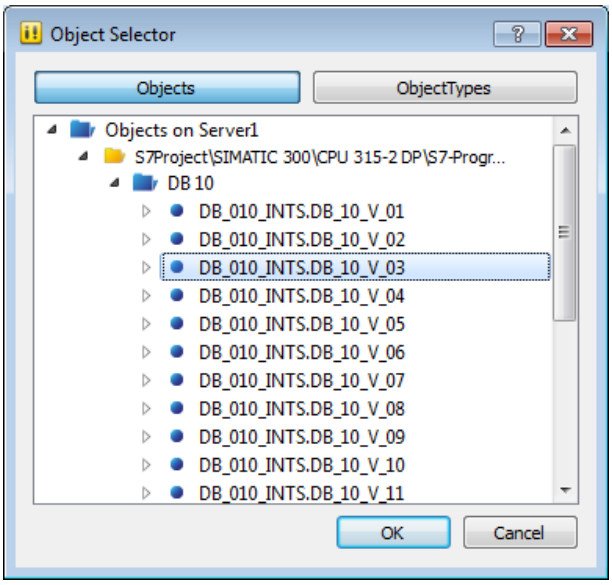

Figure 52: Select signal

- ➢ Click **Objects** button.
- ➢ Navigate to the desired signal, select it, then click **OK** button (as an alternative, you can double-click the signal).

➧ The **Object Selector** dialog window closes. You have selected a signal, for which you now can to define an alarm message.

4. Enter wording of alarm message.
   - ➢ In the **Text1** line, check if the `string` type is selected in the **Value-Type** drop-drown list.
   - ➢ In the **Default** column of the **Text1** line, enter the text of the alarm message which shall be displayed in case **Datapoint1** triggers an alarm.

   ➧ You have defined your first alarm message.

   If you want to define alarm messages for other signals, proceed as described above. You can define more alarm messages than provided by the two items (`Datapoint1` and `Datapoint2`) in the alarm management table.
5. Define more alarm messages (if necessary).

	Name	Description	Behavior	Value-Type	Default	Config	Group
1	TextCount	Number of configured Texts	mandatory	number	2		
2	Datapoint1		mandatory	address	10.DB_010_INTS.DB_10_V_03		
3	Text1		mandatory	string	This is a test alarm text 1		
4	Datapoint2		optional	address	10.DB_010_INTS.DB_10_V_19		
5	Text2		optional	string	This is a test alarm text 2		
6	Datapoint3		optional	address	10.DB_010_INTS.DB_10_V_20		
7	Text3		optional	string	This is a test alarm text 3		
8			optional	address			

Figure 53: Add new alarm messages

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- In the next free field of the **Name** column, enter `Datapoint3`. Then select `address` type from the **Value-Type** drop-drown list and select the signal in the **Default** column.
- In the **Name** column of the line below `Datapoint3`, enter `Text3`. Then select `string` type from the **Value-Type** drop-drown list and enter the text of the alarm message in the **Default** column.

For each new alarm message, increment the entries in the **Name** column accordingly (i.e. `Datapoint4/Text4`, `Datapoint5/Text5`).

8.7.2 Configuring trending

General

netSCADA devices support „trending“. Trending means that values of certain signals/variables are being continuously read and recorded in a trend buffer in defined time intervals. This allows a review of the history of the signal.

The signals/variables that shall be recorded can be selected in the **Signal Editor** (for netLINK SCADA, see section *Configuring signals in the Signal Editor* [page 56], for netSCADA Modbus, see *Selecting signals in Signal Editor* [page 66]). To do so, activate the check box in the **Trend** column of the **Signal Editor**.

Basic parameters of the trending function, like e. g. the scan time (i. e. the scanning/sampling interval) can be configured on the **Trend Recording** page of the Web Configuration Interface (see section *Trend recording* [page 100]).

For information on how to use the trend displays provided by the atvise builder, please refer to the online help of the atvise builder.

Using the netSCADA trend display

The **netSCADA** folder in the library of the display editor contains a pre-configured element for displaying trends, which can be readily used. You simply have to add the signals, which you want to use for trending, to the element.

Note:
As an alternative, you can also use other ready-made trending elements, that the atvise library offers (e. g. in the folder **ATVISE** > **Standard** > **Trend**).
The netSCADA trending element in the **netSCADA** folder however has the advantage of being capable of supervising the state of the signals to be recorded. In case it receives an invalid status bit (e. g. if the connection has been disrupted), it resets the last recorded value for that signal to zero (`0`).

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To add the netSCADA trending element to a display, proceed as follows:

➢ Select and place element.

➢ In the **Library** area (see position Ⓓ in section *GUI of the display editor* [page 73]), open the folder **netSCADA** > **Trend**.

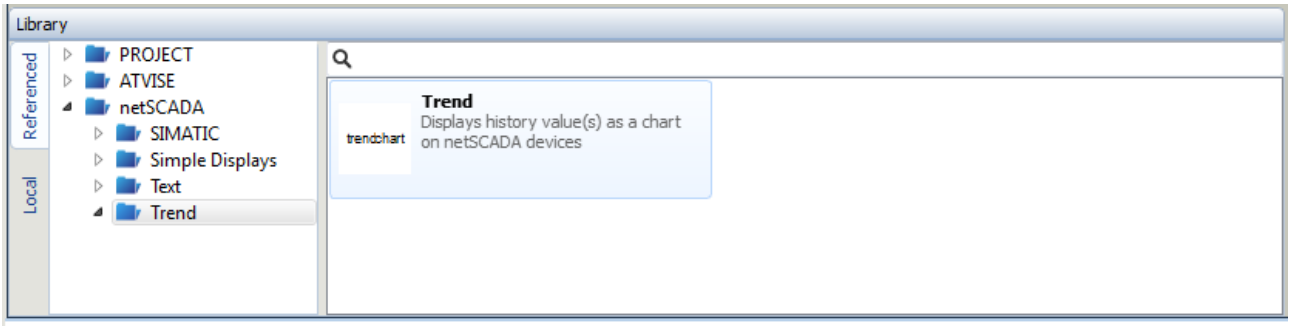

Figure 54: Trend library

➢ Select the **Trend** element and drag and drop into the drawing area. Place it onto the display at the intended position.

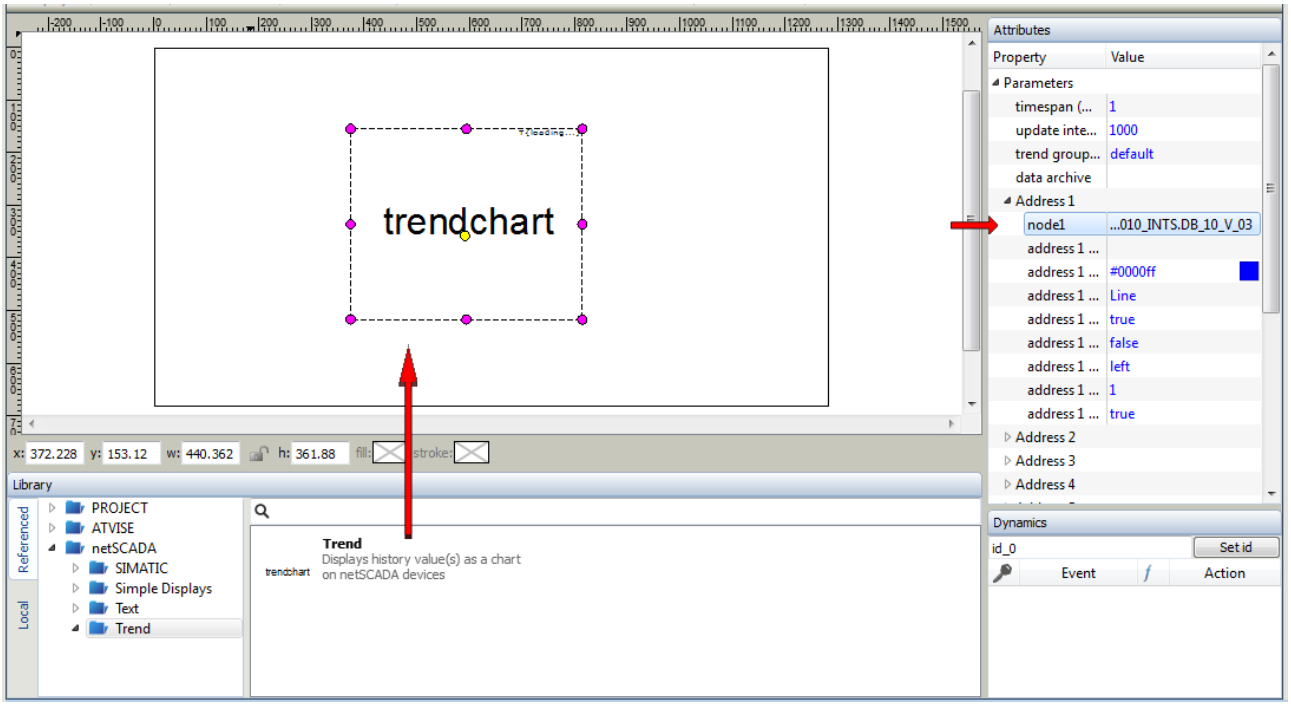

Figure 55: netSCADA trend display

1. Assign a signal to the element.

   ➢ In the drawing area, select the **Trend** element.

   ➢ In the **Attributes** area, open the **Property > Parameters** > **Address1** folder, then click into the **node1** field.

   ↬ The **node1** field changes its appearance and shows a dotted control button.

   ➢ Click ..., button to open the **Object Selector** dialog window, in which you can assign a signal to the element for trending.

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The **Object Selector** dialog window opens:

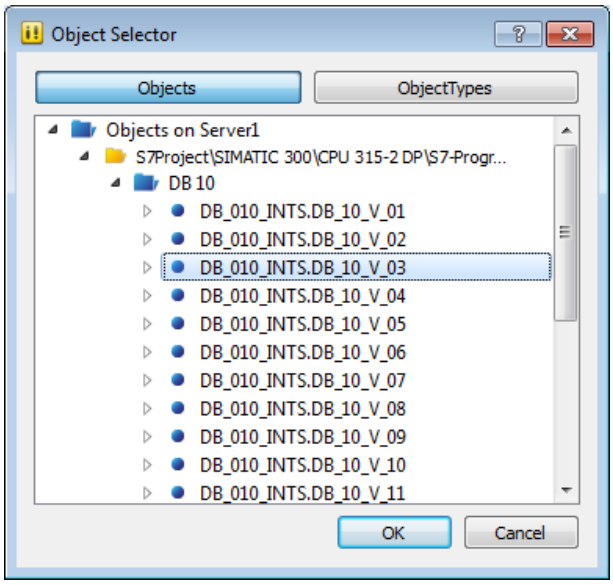

Figure 56: Assign signal to element

- Click **Objects** Button.
- Navigate to the signal, select it, then click **OK** button (as an alternative, you can double-click the signal).

The **Object Selector** dialog window closes. You have assigned the signal to the netSCADA trend element.

If you want to add further signals to the netSCADA trend element, click into the **node2** field below **Address2** and proceed as described above.

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8.8 Generating visualization and transferring it into netSCADA device

After having finished designing displays and assigning signals to the display elements, you can now generate the HTML files for your project and download them to your netSCADA device.

Important:
For this, you need an Ethernet connection between your configuration PC and your netSCADA device.

➢ In the project tree of the atvise builder, select your netSCADA project. Then use the right mouse button to open the context menu and choose **Distribute**.

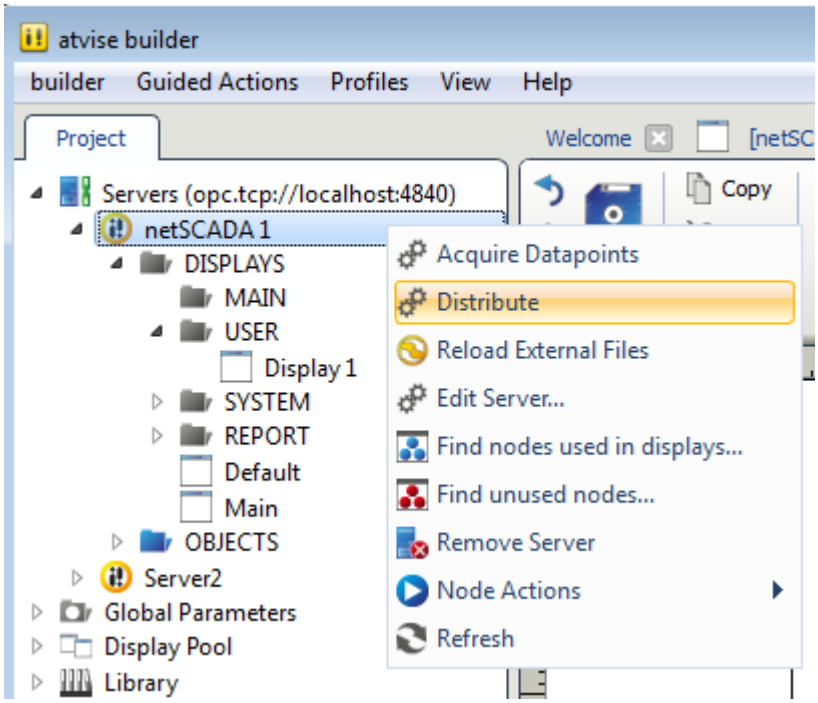

Figure 57: Generate and download HTML pages

➢ The displays are converted into HTML files and are automatically downloaded to the netSCADA device. This process can take several minutes. During the process the following message is shown:

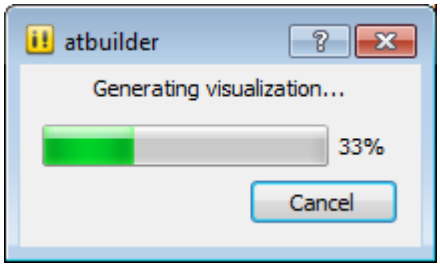

Figure 58: Generating and downloading project message

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Note:

If you are using the **Trending** function for the first time, it can take up to five minutes before the device will be ready for operation after downloading the project. This is because the memory for the trend data is getting formatted when a project with trending function is being downloaded for the first time.

This state is indicated by the blinking CONFIG LED of the netSCADA.

⇨ You have generated the visualization project and downloaded its HTML page(s) to the netSCADA device. The device now automatically resets itself. After the reset, you can connect to the device and view the results.

If your configuration PC and the netSCADA device are not properly connected during the download, the following message appears:

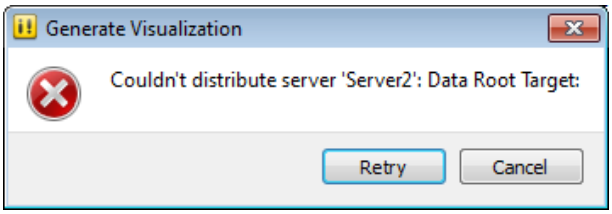

Figure 59: Download failure message

In this case, check the Ethernet connection between your configuration PC and your netSCADA device; you should check especially, whether the permanent IP address which you have assigned to the device (see section *Configuring permanent IP address (Network Settings)* [page 92]) is identical with the IP address which you have configured for the netSCADA in the atvise project (see section *Configuring netLINK SCADA device* [page 45], respectively section *Configuring netSCADA device* [page 62]).

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8.9 Displaying visualization in browser

In order to show and check your visualization, you can open your standard web browser and connect to the integrated HTML server of the netSCADA device directly from within the atvise builder. Please note that for showing “real” data on your web visualization pages, a “living” fieldbus communication needs be connected to the netSCADA device.

➢ In the menu bar of the atvise builder, choose **Guided Actions** > **Open Web Browser for Server**, then select your netSCADA webMI Server:

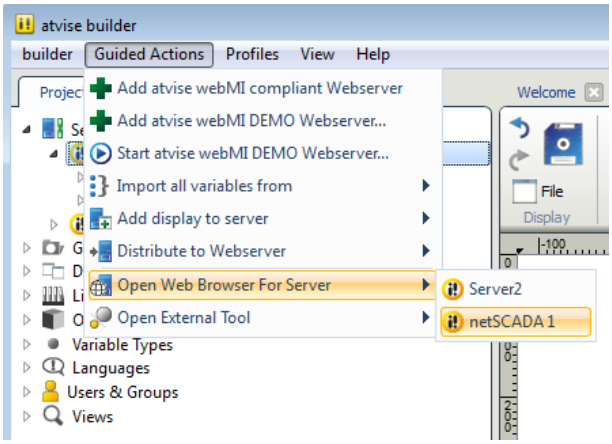

Figure 60: Open web browser in atvise builder

⇨ Your standard web browser on your configuration PC starts, connects automatically to the IP address of the netSCADA device and displays the visualization:

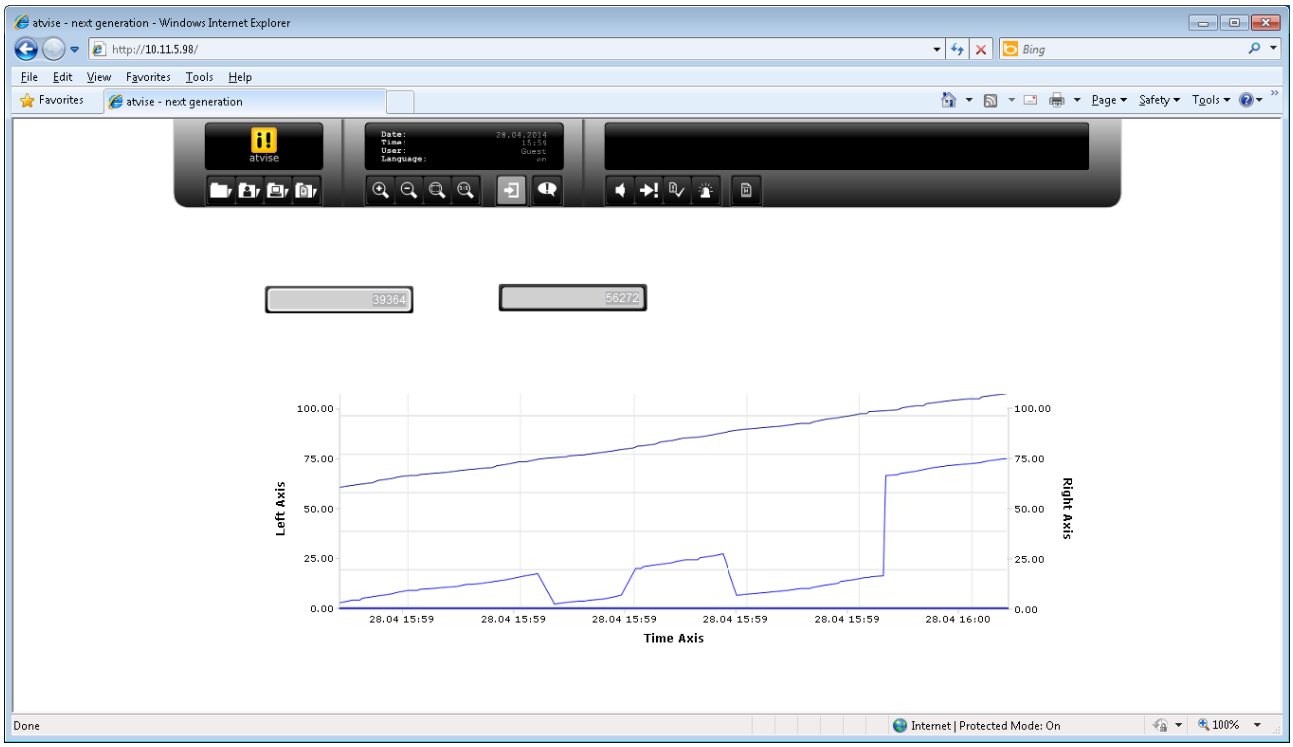

Figure 61: Example of visualization web page with trend

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Note:

Of course you can connect to the web visualization pages of the netSCADA device from any other PC without the atvise builder, just by entering the IP address of your netSCADA device into your web browser, e. g. `HTTP://10.11.5.98`.
If you are connected to the netSCADA device and want to change from its visualization page to the netSCADA Web Configuration Interface, you can do so by simply adding the string `/config` behind the IP address of the netSCADA in your web browser, e. g. `HTTP://10.11.5.98/config`. After entering user name and password (default user: `admin`, default password: `admin`), the start page of the Web Configuration Interface opens.

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9 Using the Web Configuration Interface of the netSCADA devices

9.1 Overview

The Web Configuration Interface of the netSCADA device allows you to administer your device via standard web browser and Ethernet interface. On the pages of the Web Configuration Interface, you can check basic parameters of your device, update its firmware or reset it. Furthermore, you can configure the IP address, the real time clock and the trend recording parameters of the netSCADA. Here, you can also delete all visualization pages and configuration data which have been stored on the device.

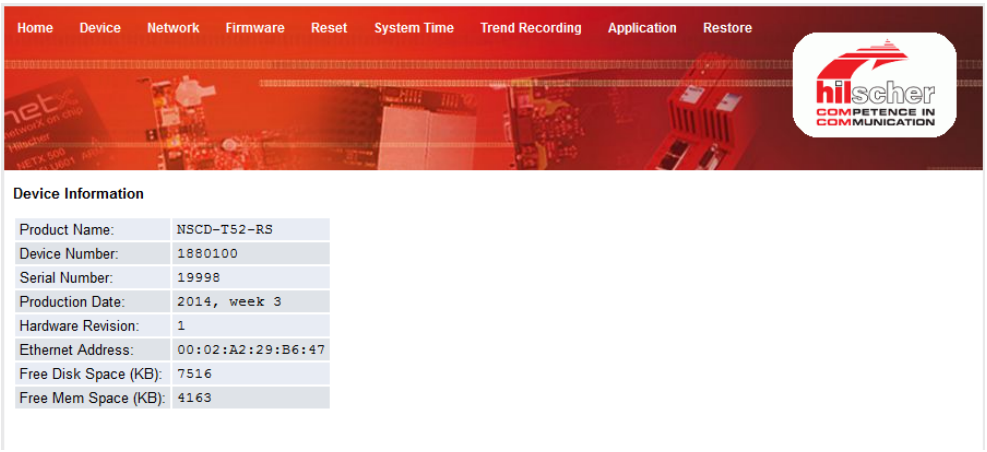

Figure 62: Start page Web Configuration Interface

Web page	Description	For details see
Device	**Device Information**: Start page of the Web Configuration Interface. Shows basic device parameters. This page can be opened by using the **LAN Scanner and Configuration Tool** (integrated in the atvise builder) or by entering the URL `HTTP://<IP address>/config` in your web browser.	Section *Start page (Device Information)* [▶ page 91]
Network	**Network Settings**: Non-volatile configuration of the IP address of the device.	Section *Configuring permanent IP address (Network Settings)* [▶ page 92]
Firmware	**Firmware Identification / Firmware Update**: Display of firmware version and firmware update.	Section *Updating firmware* [▶ page 94]
Reset	**Device Reset**: Device restart.	Section *Resetting device* [▶ page 96]
System Time	Display and configuration of the system time of the device.	Section *Configuring the system time* [▶ page 97]
Trend Recording	**Trend Settings**: Configuration of the trend recording function.	Section *Trend recording* [▶ page 100]
Application	**Erase Application**: Erases the atvise project (including user authentication parameters) from the device.	Section *Erasing visualization project (application data)* [▶ page 103]
Restore	**Restore Factory Settings**: Erases all data except the firmware from the device and thus restores the factory settings of the device. This function is available only within five minutes after device reset. This page can be opened directly under the URL `http://<IP address>/factoryrestore` without entering a password.	Section *Factory restore* [▶ page 104]

Table 28: Web pages of the Web Configuration Interface

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Note:

The **Home** page shown as hyperlink in the navigation pane is the start page of the *visualization*, which can be reached under the URL `HTTP://<IP Address>`, not of the *configuration* pages. If you click on the **Home** link before any atvise visualization project (i. e. an “application”) was downloaded to the device, an error message will be displayed.

The Web Configuration Interface supports user and password administration (user authentication) with MD5 coding. Users and passwords can be defined in the atvise builder software and downloaded along with the visualization project to the device.

Important:

In its state of delivery, the device has the IP address `192.168.0.133`.
If this preset address is not suitable for you, you must first assign a new temporary IP address to the device by using the **LAN Scanner and Configuration Tools** (see section *Assigning temporary IP address* [page 41]), in order to make the Web Configuration Interface accessible for you via Ethernet IP in the first place. The final configuration and permanent storage of the IP address can then be made on the **Network** page of Web Configuration Interface (see section *Configuring permanent IP address (Network Settings)* [page 92].

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9.2 Accessing the Web Configuration Interface

9.2.1 Prerequisites

- The netSCADA device is ready for operation.
- The device is connected to a network via its Ethernet interface.
- PC with web browser and connection to Ethernet network.
- You must know the IP address of the netSCADA device.
- You must know user name and password of the web configuration interface (see section User Authentication).

9.2.2 User authentication

Access to the Web Configuration Interface of the netSCADA device is protected by a user authentication. On calling up one of these web configuration pages, a password dialog appears.

Preset default parameters of the user authentication are

User name: `admin`
Password: `admin`

These default parameters remain valid until you have defined a new `admin` user and a password in the **atvise builder** and downloaded it along with the visualization project into the netSCADA device.

Important:
In order to protect the Web Configuration Interface from unauthorized access, you must define a new `admin` user with a new password in the **Users & Groups** node of the **atvise builder**. Create a new password, so that it will not be any longer possible to access the Web Configuration Interface by using the default `admin` password. For more information on **Users & Groups** in atvise, please consult the online help of the atvise builder.

Please note that a “Factory Restore” (see section *Factory restore* [page 104]) resets the user authentication of the netSCADA device to its old default parameters `admin/admin`.

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9.2.3 Connecting to Web Configuration Interface

You connect to the Web Configuration Interface by entering the IP address of the netSCADA device with the appending string `/config` into the address bar of your web browser. So, if for instance the IP address of your device is `10.11.5.98`, enter `http://10.11.5.98/config` into the address bar.

If you have just recently assigned a temporary IP address to the device by using the **LAN Scanner and Configuration Tool**, you can connect to the Web Configuration Interface instantly from within the still opened tool by clicking the **Configure** button, then choosing **Open Web Configuration Page…**entry from the context menu. Your standard web browser on your configuration PC starts and connects to the IP address and the login dialog of the Web Configuration Interface of the netSCADA device.

After having entered user name and password, you will be directed to the start page of the Web Configuration Interface called **Device Information**. From there, you can navigate to the other web configuration pages by clicking on the hyperlinks in the navigation pane (top area) of the page.

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9.3 Start page (Device Information)

The home page of the Web Configuration Interface displays basic identification parameters of your netSCADA device.

The home page opens after choosing the **Open Web Configuration Page…**option in the **LAN Scanner and Configuration Tool** (see section *Assigning temporary IP address* [page 41]). You can also open this page by entering the URL `http://<IP-Address>/config` into the address bar of your web browser.
After having navigated to other pages of the Web Configuration Interface, you can use the **Device** hyperlink in the navigation pane to return to this home page.

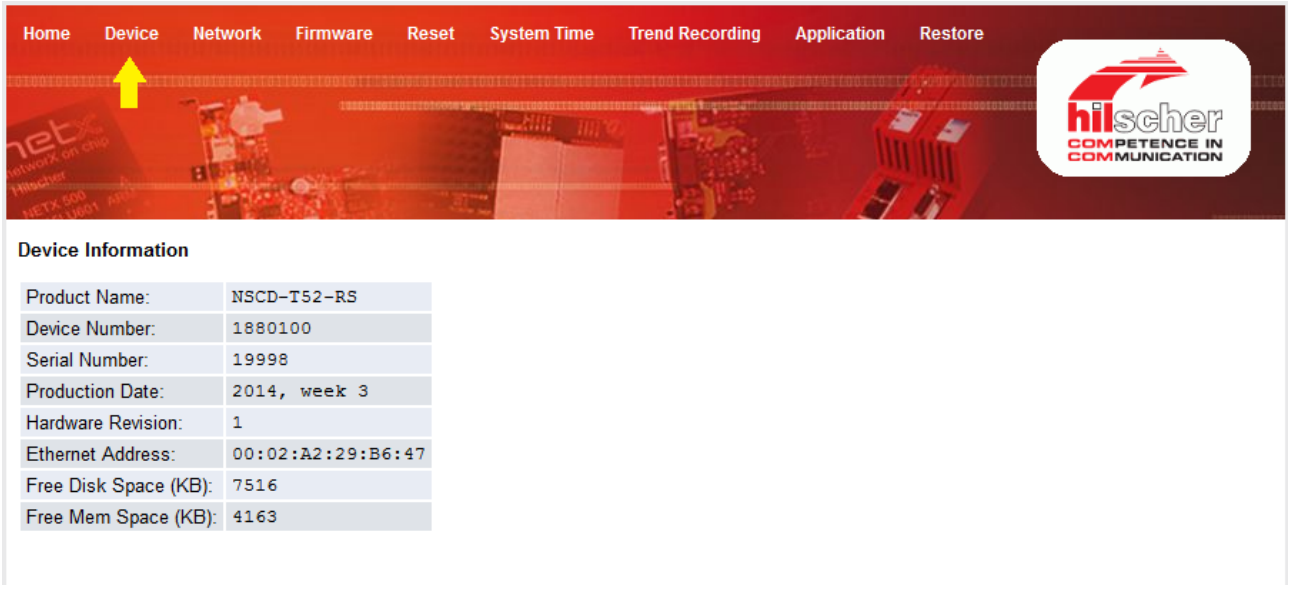

Figure 63: Home page of the Web Configuration Interface

The **Device Information** page displays the following parameters:

Product Name: Name of the device

Device Number: Part number of the device

Serial Number: Serial number of the device

Production Date: Production date of the hardware

Hardware Revision: Hardware revision number

Ethernet Address: MAC Address of the device

Free Disk Space (KB): Free space in flash file system

Free Mem Space (KB): Free space in RAM

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9.4 Configuring permanent IP address (Network Settings)

On the **Network Settings** page, you can configure the permanent IP address parameters of netSCADA devices. If you choose the option **Store new settings permanently**, these network settings will be stored permanently in the netSCADA device, i. e. they will remain valid even after device reset or power failure.

Note:
A **temporary IP Address** can be assigned to the netSCADA device anytime by using the **LAN Scanner and Configuration Tool**, which is a plug-in of the atvise builder (see section *Assigning temporary IP address* [page 41]).

To open the **Network Settings** page, click the **Network** hyperlink in the navigation pane.

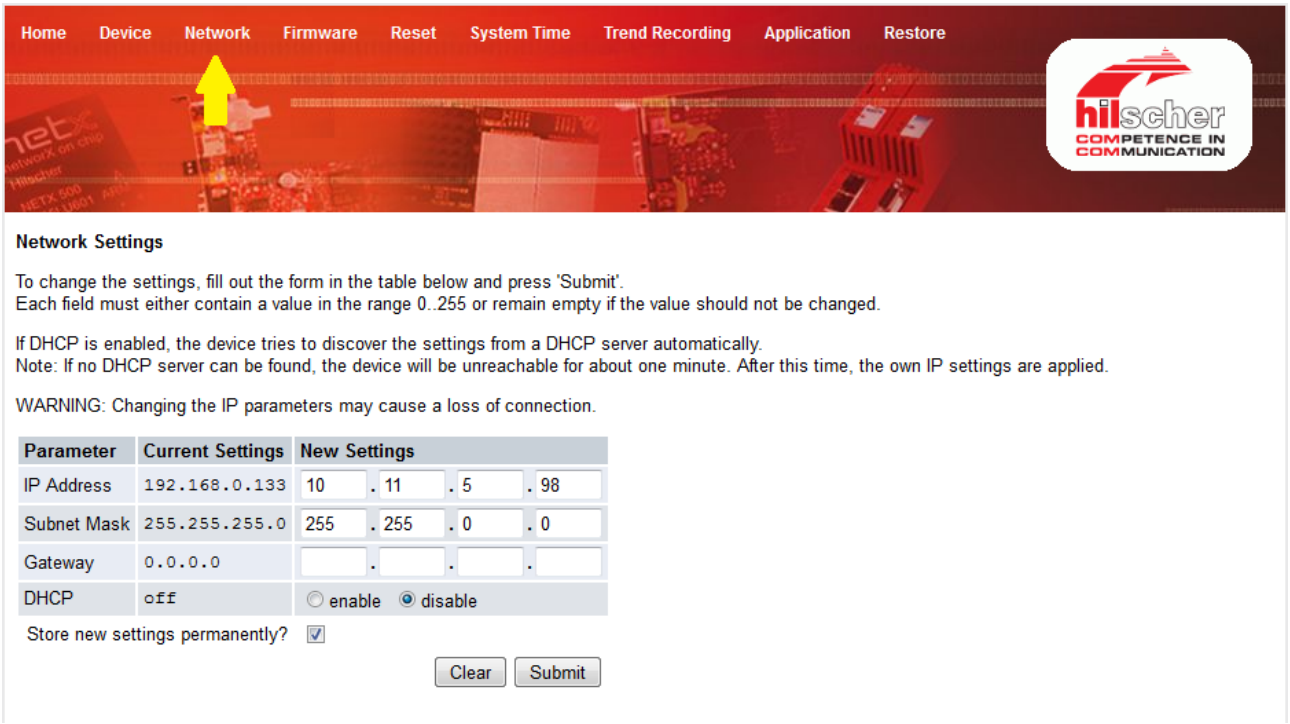
Home
Device
Network
Firmware
Reset
System Time
Trend Recording
Application
Restore
hilscher
COMPETENCE IN COMMUNICATION
Network Settings
To change the settings, fill out the form in the table below and press 'Submit'.
Each field must either contain a value in the range 0..255 or remain empty if the value should not be changed.
If DHCP is enabled, the device tries to discover the settings from a DHCP server automatically.
Note: If no DHCP server can be found, the device will be unreachable for about one minute. After this time, the own IP settings are applied.
WARNING: Changing the IP parameters may cause a loss of connection.
Parameter
Current Settings
New Settings
IP Address
192.168.0.133
10 . 11 . 5 . 98
Subnet Mask
255.255.255.0
255 . 255 . 0 . 0
Gateway
0.0.0.0
DHCP
off
enable
disable
Store new settings permanently?
Clear
Submit

Figure 64: Network Settings

Important:
Keep in mind that changing the IP parameters may cause loss of connection!

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The **Parameter** column displays the IP network parameters that can be configured:

Parameter	Description
IP Address	IP Address of the netSCADA device
Subnet Mask	Subnet mask of the local IP network.
Gateway	IP Address of the local gateway. Needs to be specified if the netSCADA is supposed to communicate with devices outside the local network via a gateway/router, e. g. with an external SNTP server for the purpose of synchronizing the system time of the netSCADA device (see section *Configuring the system time* [page 97]).
DHCP	If you choose this option by selecting the **enable** radio button, the netSCADA device tries to receive its IP address from any available DHCP server. The manually entered IP address then becomes obsolete and will be used only as a “fall back” address.

Table 29: Parameter Network Settings

The **Current Values** column displays the IP settings which have been used so far, respectively the factory default IP settings (in case they haven’t been changed yet).

Note:
Please note that a temporary IP address assigned by the **LAN Scanner and Configuration Tool** will not be displayed in the **Current Settings** column.

In the **New Settings** column, you can use the provided fields for entering new values for the parameters or **enable** the **DHCP** option. If you **enable** the **DHCP** option, the netSCADA tries to receive its IP address from any available DHCP server. The manually entered IP address then becomes obsolete.

Note:
If you choose the DHCP option but no DHCP server can be found after reset, the netSCADA device will remain unreachable for approximately one minute. After this period, the last stored valid IP address will be used by the device as a “fall back” configuration.

By clicking the **Submit** button, you can save your new settings. Please note that if you uncheck the **Store new settings permanently** option, these settings will only be stored “volatile” in the device.

The following control elements are available:

Control element	Description
Store new settings permanently	Causes “non-volatile” storage of the IP parameters, i. e. the parameters remain valid even after reset or power-on cycle. If you uncheck this option, the parameters will be stored only “volatile”; i. e. the device falls back to its last permanently stored valid IP address after reset or power-on cycle.
Clear	Undoes changes that have not yet been submitted.
Submit	Stores new settings.

Table 30: Control elements Network Settings

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9.5 Updating firmware

The **Firmware** page displays the version of the currently loaded firmware and provides a function for downloading a new firmware version into your device. Configuration data stored in the device will remain intact after a firmware update.

To open the firmware page, click the **Firmware** hyperlink in the navigation pane.

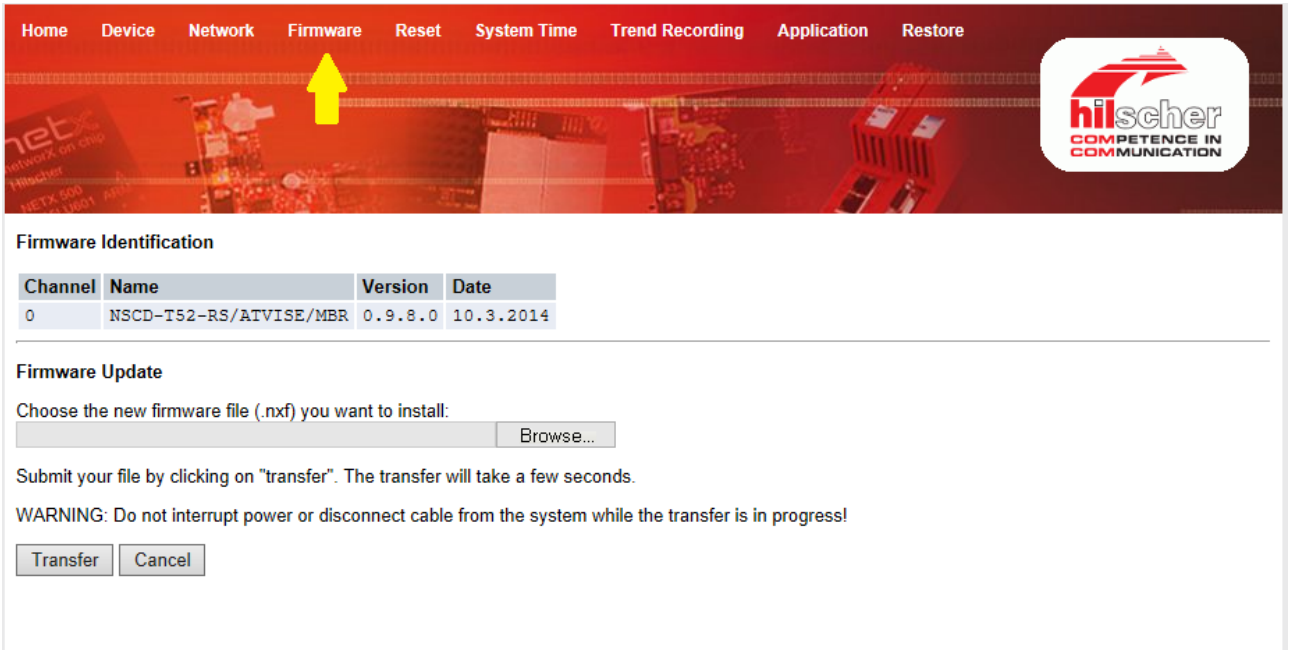

Figure 65: Firmware update page

Note:
Before the update takes place, the system automatically checks whether the firmware file you have selected for download fits the device class and the hardware properties of the netSCADA device.

Firmware Identification

The **Firmware Identification** section displays the following information about the currently loaded firmware:

- **Channel**: Channel number (Port number)
- **Name**: Name of loaded firmware
- **Version**: Version of loaded Firmware
- **Date**: Date of loaded firmware

Firmware Update

In the **Firmware Update** section, you can select a new firmware file in order to replace the old firmware, and start the update.

Click **Browse…** button to open a dialog to select the firmware you want to download. Path and name of the selected file are displayed in the adjacent field.

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File names of netSCADA firmware are as follows:
NL 50N-MPI-ATVISE: `LN303100.nxf`
NSCD-T52-RS/ATVISE/MBR: `T07100R0.nxf`

Element	Description
Selection field	Shows selected file and its location
Browse…	Opens the file selection dialog
Transfer	Downloads selected firmware file to device
Cancel	Cancels firmware update and clears selection field

Table 31: Control elements firmware update

NOTICE

Hazard of device damage by power failure!

Do not interrupt the power supply or disconnect the network cable during transfer of the firmware file.
A power failure while switching from the old to the already stored new firmware can cause severe malfunction of the device.

After you have started the download by clicking the **Transfer** button, the validity of the firmware file is being checked by the system. If the file fails the validity check, the file will not be stored in the device and an error message will be displayed on the web page. If the file passes, a **Transfer succeeded** message will be displayed.

After successful transfer, you will be asked to reset the device in order to start up the new firmware:

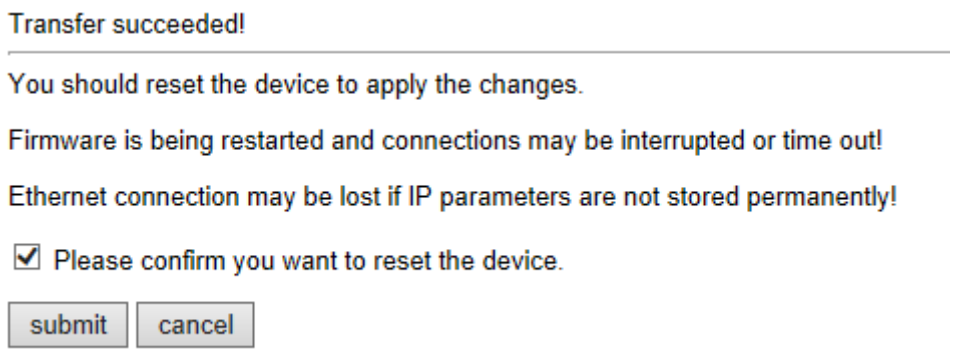
Transfer succeeded!
You should reset the device to apply the changes.
Firmware is being restarted and connections may be interrupted or time out!
Ethernet connection may be lost if IP parameters are not stored permanently!
Please confirm you want to reset the device.
submit
cancel

Figure 66: Transfer of firmware succeeded message

Check **Please confirm you want to reset the device**, then click **submit** button.

Note:
If the box in front of **Please confirm…** is not checked, the old firmware keeps on running in the device. However, this firmware is now “pre-installed” and will become active after the next reset or power-on cycle.

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9.6 Resetting device

On the **Reset** page, you can restart your netSCADA device.

To open the **Reset** page, click the **Reset** hyperlink in the navigation pane.

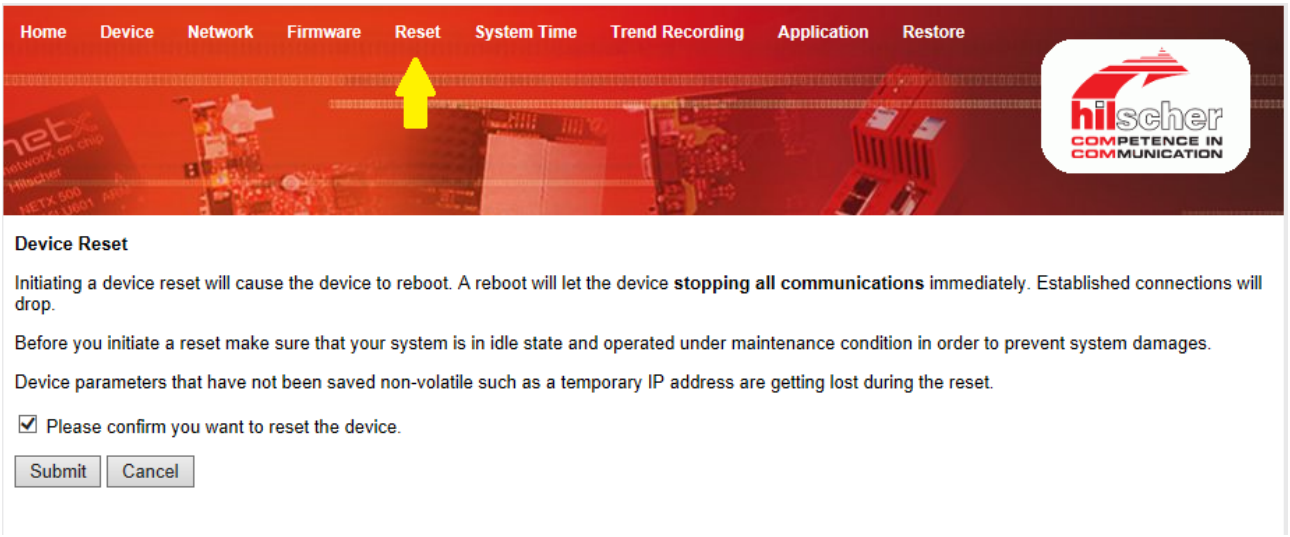
Home
Device
Network
Firmware
Reset
System Time
Trend Recording
Application
Restore
hilscher
COMPETENCE IN COMMUNICATION
Device Reset
Initiating a device reset will cause the device to reboot. A reboot will let the device stopping all communications immediately. Established connections will drop.
Before you initiate a reset make sure that your system is in idle state and operated under maintenance condition in order to prevent system damages.
Device parameters that have not been saved non-volatile such as a temporary IP address are getting lost during the reset.
Please confirm you want to reset the device.
Submit
Cancel

Figure 67: Device reset

A reset has to be made after every firmware or configuration update.
It has the following consequences:

- The firmware is being restarted and connections will be interrupted or timed out.
- I/O bus communication is being stopped.
- The IP connection may be lost if the IP parameters have not been configured on the **Network Settings** page and stored in the device permanently.

Activate the checkbox in front of **Please confirm...** to acknowledge that you want to reset the device.
To start the reset, click **Submit** button.
Click **Cancel** button to uncheck the checkbox in front of **Please confirm...**

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9.7 Configuring the system time

On the **System Time** page, you can check the actual system time of the device, set a new system time manually or configure automatic time synchronization via SNTP or NTP server.

To open the **System Time** page, click the **System Time** hyperlink in the navigation pane.

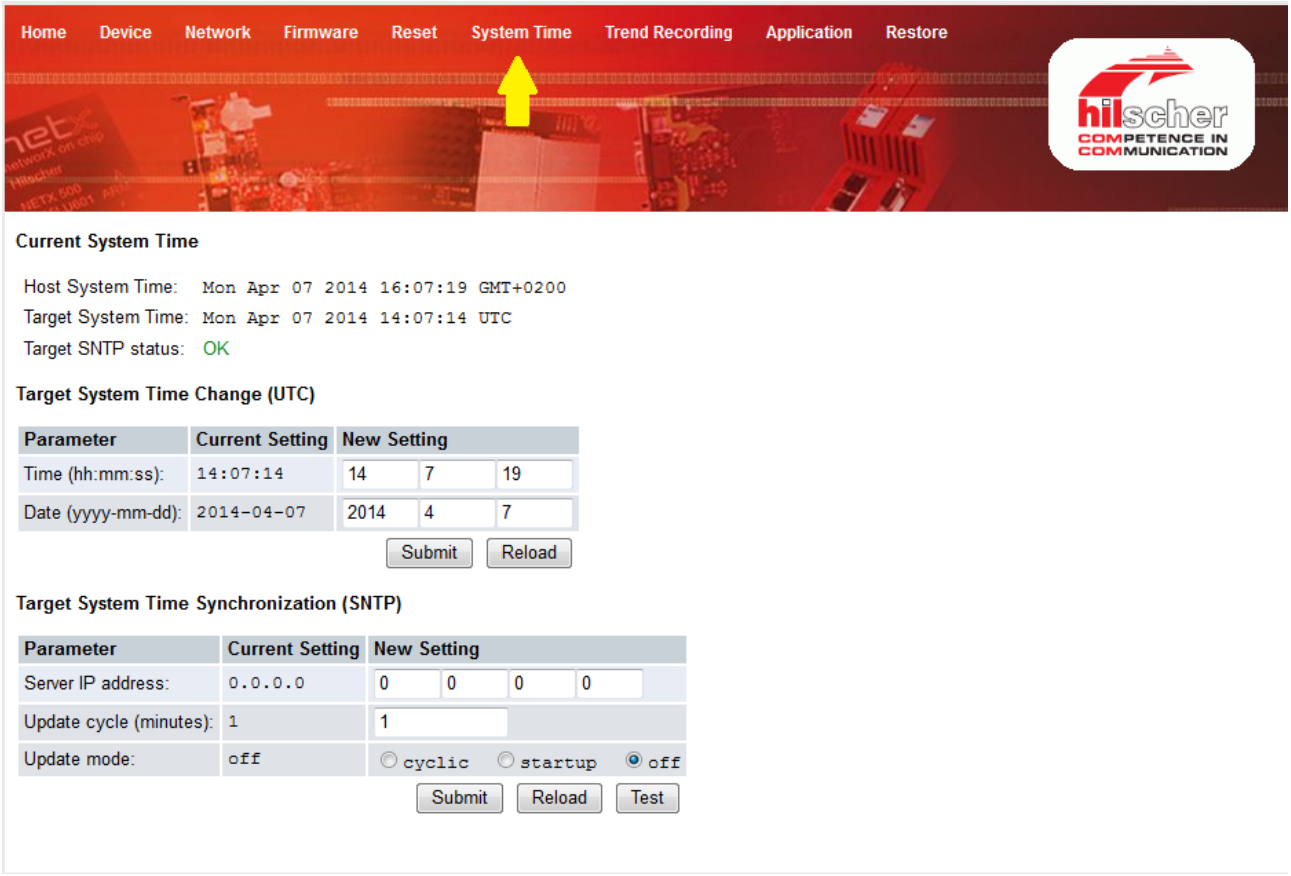

Figure 68: System time

Current System Time

Host System Time: shows date and system time (GMT) of the configuration PC (i. e. the PC from which you are currently accessing the netSCADA) at the time of access.

Target System Time: shows date and system time (UTC) of the netSCADA at the time of access.

Note:

The netLINK SCADA **NL 50N-MPI-ATVISE** is not equipped with a hardware real time clock. Thus, if you are NOT using time synchronization via SNTP server for this device, the system time of the netLINK SCADA will by default be set on `January 1th 2000, 00:00:00` o'clock after each reset or power-on cycle. After reset, the clock starts and indicates the time that has elapsed since the reset. If, however, you enable time synchronization via SNTP, the device will receive the actual time from the SNTP server after reset.

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Target SNTP status: If you have configured time synchronization via SNTP server, but the netSCADA device can't connect to the SNTP server, an error message will be shown here.

Target System Time Change (UTC)

Here you can change the system time of the netSCADA device. You have two options to do this:
You can either enter the time values manually into the fields of the **New Setting** column, or you can take over the current date and time values from the configuration PC by clicking the **Reload** button (the display of the actual system time of the netSCADA and the host will then also be updated).

By clicking the **Submit** button, the values of the **New Setting** field will be saved in the netSCADA device. The **Current Setting** column shows the last measured system time of the netSCADA device.

Note:
The submitted time will automatically be converted into UTC time. On the visualization pages, the time will be converted back and displayed as local time. Summer/winter time will automatically be taken into account.

Target System Time Synchronization (SNTP)

Here you can configure time synchronization by SNTP server for your netSCADA device. To do so, proceed as follows:

- In the **New Setting** fields of the **Server IP address** parameter, enter the IP address of the SNTP server that you want to use for time synchronization.

Important:
Pleased note, that you need to set a valid gateway address on the **Network Settings** page (see section *Configuring permanent IP address (Network Settings)* [page 92]) if you want to use an external time server which is located outside of your local Ethernet network.

- In the **New Setting** field of the **Update cycle (minutes)** parameter, enter the number of minutes after which the SNTP server shall be regularly contacted by the netSCADA device for time synchronization (if you want to use cyclic synchronization mode).
- Choose the **Update mode**:
  cyclic: time synchronization takes place according to the interval which you have defined in the **Update cycle (minutes)** field.
  startup: time synchronization takes place only after reset/power-on cycle.
  off: no SNTP service is being used.
- Click **Test**, to check the connection to the IP address of the SNTP server which you have entered in the **New Setting** column.
- A note/response will be shown in the footer, indicating whether a connection to the SNTP can be established or not.

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- If the **Test succeeded** messages in the footer indicates that the test connection to the SNTP server did succeed, click **Submit** button, to save the values in the **New Setting** column in the netSCADA.

The **Current Settings** column displays the last saved values.

With the **Submit** button, you can save the values in the **New Setting** column in the netSCADA.

With the **Reload** button, you can reload the last saved values.

With the **Test** button, you can establish a test connection to the SNTP server under the IP address which you have entered in the **New Setting** field.

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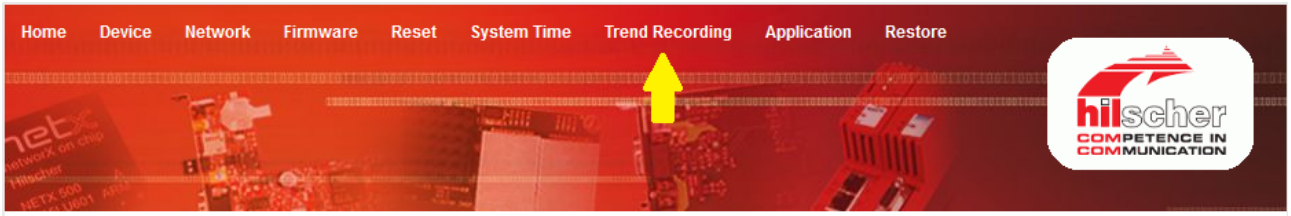
9.8 Trend recording

On the **Trend Recording** page, you can check the current parameters of the trending function and set the **trend buffer mode** (circular or ring buffer) and the **scan time** (scanning/sampling interval).

Here, you can also test, how changing the **scan time** would affect the other trending parameters (e. g. the maximum recording time).

Note:
The settings on this page affect all variables or signals that have been chosen for the trending generally. Please note, that you can not select individual variables/signals for the trending on this page; the selection of variables/signals to be recorded has to be made in the **Signal Editor** of the atvise builder during the creation of the visualization project (for the NL 50N-MPI-ATVISE device, see section *Configuring signals in the Signal Editor* [page 56]; for the NSCD-T52-RS/ATVISE/MBR device, see section *Selecting signals in Signal Editor* [page 66]).

To open the **Trend Recording** page, click the **Trend Recording** hyperlink in the navigation pane.



Trend Settings

Use the 'TAB' key for reaching the editable fields in the table below to change trend settings.
Click 'Set Defaults' to set all editable and derived fields to their built-in default values.
Click 'Calculate Derived Values' to see a preview of derived trend settings after editing.
Click 'Clear Trend' to clear the trend history without changing the current trend settings.
Click 'Submit Changes' to apply the changed settings. **This will also clear the trend history.**

Parameter	Current Setting	New Setting
Trend buffer mode:	circular	(•) circular ( ) linear
Trend buffer type:	non-volatile	non-volatile
Trend buffer size (tags):	520704	520704
Number of recorded tags:	46	46
Number of recorded variables:	2	2
Scan time (milliseconds, [200 .. 86400000]):	5000	5000
Flush time (milliseconds):	10000	10000
Max. recording time (hours):	361	361
Remaining time until stop/overwrite (hours):	361	361

Set Defaults | Calculate Derived Values | Clear Trend | Submit Changes

Figure 69: Trend Recording

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The **Trend Settings** table features the following parameters:

Parameter	Description
Trend buffer mode	Here you can set the mode of the trend buffer. **circular**: Ring buffer mode. When the buffer is full, the oldest recorded data will be overwritten by the latest recorded data. **linear**: When the buffer is full, recording stops and no new data will be written.
Trend buffer type	Memory type of the trend buffer. **volatile**: Trend data is being stored in RAM and gets lost after power-off. This is the case for the NL 50N-MPI-ATVISE device, because it has no flash memory chip for storing the trend data. **non-volatile**: Trend data is being stored in a flash memory chip and survives after power-off (NSCD-T52-RS/ATVISE/MBR).
Trend buffer size (tags)	Maximum quantity of tags which can be stored in the trend buffer.
Number of recorded tags	Quantity of tags which have been stored in the trend buffer so far. This value depends on the **Number of recorded variables** and the **Scan time**.
Number of recorded variables	Quantity of variables/signals to be recorded. These variables/signals are selected in the Signal Editor of the atvise builder during the creation of the visualization project.
Scan time (milliseconds, [200..86400000])	Here you can set the sampling interval of the variables/signals in milliseconds. Possible range is 200 to 86400000 milliseconds (24 hours). **Example**: If you set the Scan time on 5000, the variables/signals which have been chosen for trend recording will be scanned every five seconds and their values will be recorded as “tags”.
Flush time (milliseconds)	Maximum period of time after which recorded tags are finally written into the trend buffer. This value depends on the **Scan time**.
Max. recording time (hours)	Maximum recording time period. This value depends on the **Number of recorded variables**, the **Scan time** and the **Trend buffer size**. **Note**: The displayed value has always been automatically rounded down to the full hour by the system.
Remaining time until stop/overwrite (hours)	Remaining time period in hours until the trend buffer will be full, and – in consequence – the recording will be stopped (if linear buffer is used) or old data will be overwritten (if circular buffer is used). This value depends on the **Number of recorded variables**, the **Scan time** and the **Trend buffer size**. **Note**: The displayed value has always been automatically rounded down to the full hour by the system.

Table 32: Trend settings parameters

The **Current Setting** column shows the currently valid parameters.

In the **New Setting** column, you can change the **Trend buffer mode** and the **Scan time** (scanning/sampling interval), if necessary. By clicking the **Calculate Derived Values** button after changing the **Scan tim**e, you can test how changing the **Scan tim**e will affect the other parameters. The calculated new values of the parameters will then be displayed in the **New Setting** column.

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The following control elements are available:

Control element	Description
Set Defaults	All configurable parameters will be reset to their default value, i. e. **Trend buffer mode**: circular **Scan time (milliseconds)**: 5000
Calculate Derived Values	Calculates the new values of the depending parameters after having changed the **Scan time**. The new values will be displayed in the **New Setting** column.
Clear Trend	Deletes the stored trend data without changing the configured trend settings.
Submit Changes	Saves new settings and deletes already stored trend data.

Table 33: Control elements Trend Settings

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9.9 Erasing visualization project (application data)

On the **Application** page, you can check how much disk space the currently loaded application (i. e. the data of the atvise visualization project) consumes on the flash memory component of the netSCADA device. You can also erase the currently loaded application from the device here.

To open the **Application** page, click the **Application** hyperlink in the navigation pane.

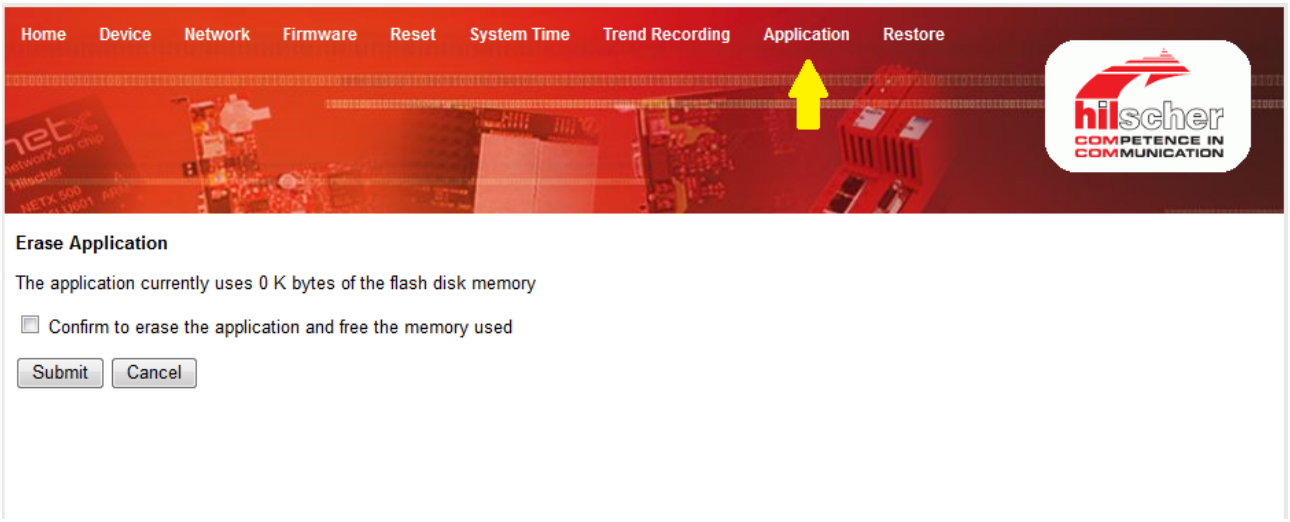

Figure 70: Erase application page

Important:
Erasing the application data also deletes the **security.cfg** file on the netSCADA device, which contains the customized user authentication data that has been defined in the atvise project. Thus, erasing the application data reinstates the old default **admin** user and the default **admin** password. These default authentication parameters then remain valid until you have downloaded to the device a new atvise project containing new customized authentication parameters.

The device configuration parameters of the netSCADA, like the IP address (**Network Settings**), the system time (**System Time**) and the settings of the **Trend Recording** are not affected by the erasing of the application data. Recorded trending data will not be deleted either, however the pure trend data might be rendered useless because of the deleted and now missing application.

Erase Application

If you want to erase the application, proceed as follows:

Activate the checkbox in front of **Confirm to erase the application...**, to acknowledge that you want to erase the application data. To start erasing, click **Submit** button.
If you don’t want to erase, click **Cancel** button to uncheck the checkbox in front of **Confirm to erase…**

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9.10 Factory restore

On the **Factory Restore** page, you can restore the „factory settings“ of the netSCADA device, i. e. reset the device to its “state of delivery”. In consequence, all application or configuration data stored in the device (except for the firmware) will be deleted or reset to default.

This function is available only within five minutes after device reset (see section *Resetting device* [page 96]); the necessary control elements on the **Factory Restore** page will be visible/active only if a reset has been performed immediately before.

The **Factory Restore** page can be opened directly under the URL `http://<IP Address>/factoryrestore` without entering a password.

Important:

Please note, that by performing a **Factory Restore**, the IP address set on the **Network Settings** page (see section *Configuring permanent IP address (Network Settings)* [page 92]) will be deleted. The device thus will be reset to its default IP address `192.168.0.133`, sub net mask `255.255.255.0`.

If you don’t want to use this preset default IP address, you then have to use the **LAN Scanner and Configuration Tools** (which is integrated as plug-in in the atvise builder) to first assign a temporary IP address to your device and then connect to the Web Configuration Interface in order to re-configure your desired permanent IP address on the **Network Settings** page.

Please note, that a **Factory Restore** also deletes the **security.cfg** file, which contains the user authentication data. This reinstates the old default user authentication parameters (user: `admin`, password: `admin`) for accessing the Web Configuration Interface, until you have defined and downloaded new user authentication data in a new atvise project.

To open the **Factory Restore** page, click the **Restore** hyperlink in the navigation pane or enter the URL `http://<IP Address>/factoryrestore` into the address bar of your web browser.

Note:

A “factory restore” for the **NSCD-T52-RS/ATVISE/MBR** (netSCADA for Modbus) can also be performed via USB, in case the device can not be reached via Ethernet IP. For more information, see chapter *Firmware recovery of NSCD-T52-RS/ATVISE/MBR via USB* [page 106].

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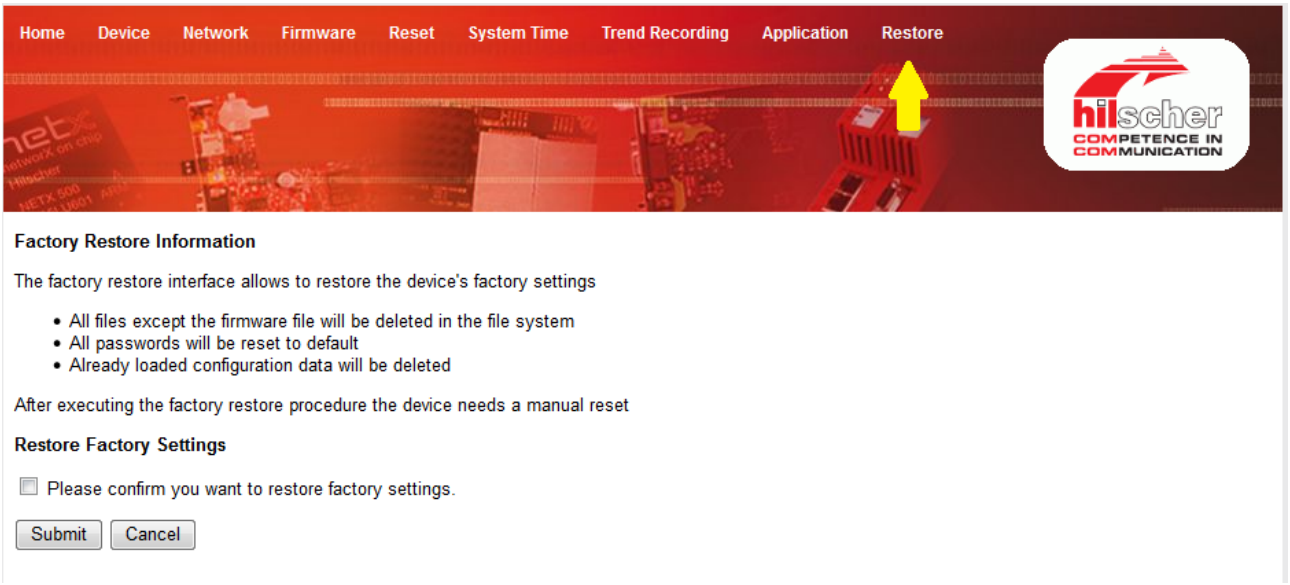

Figure 71: Factory Restore

To restore the factory settings, proceed as follows:

➢ Reset the device (see section *Resetting device* [▷ page 96]).

➢ Open **Factory Restore** page.

➢ Within five minutes after reset, activate the checkbox in front of **Please confirm you want to restore factory settings**, to acknowledge that you want to reload the factory settings of the device.

➢ Click **Submit** button to start the restoration.

Note:
The **Cancel** button un-checks the checkbox in front **Please confirm you want to restore…**

↬ All files except for the firmware are deleted. This can take a few seconds.

➢ Reset the device again (see section *Resetting device* [▷ page 96]).

⇨ You have restored the factory settings of the device.

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10 Firmware recovery of NSCD-T52-RS/ATVISE/MBR via USB

Overview

If after power-on the SYS LED of the NSCD-T52-RS/ATVISE/MBR (see section *LEDs NSCD-T52-RS/ATVISE/MBR* [page 112]) is consistently blinking yellow and green at a rate of 1 Hz, the device is in boot mode and is not able to start the firmware. The firmware file of the netSCADA is missing or corrupted. In this state, the device can not be operated and needs to be recovered by loading a new firmware file into the device via USB connection.

For this, you need a USB cable with a Mini USB connector and the Hilscher **ComProX** tool, which is stored on the netSCADA DVD in the `Supplements & Examples\Device Recovery\NSCD-T52-RS_ATVISE_MBR Factory Reset USB` directory. **ComProX** can be executed directly from DVD, it does not need to be installed on your configuration PC.

Note, that for recovery via USB, you need to install the USB driver for the netSCADA device on your configuration PC. This driver allows communication with devices lacking functional firmware.
It is recommended to install the USB driver by using the `setup.exe` installation program *before* you connect the netSCADA device via USB cable. This driver installation program is stored on the netSCADA DVD in the `Setups & Drivers\USB Driver` directory. It can be started by a double-click. Then simply follow the instructions given in the dialog windows of the installer routine.

Note also the following about recovery via USB:
Although any old firmware file that may have existed in the netSCADA device will be overwritten by downloading the new file (which can be recognized by the `.NXF` file name extension), all other files stored in the internal load memory of the device remain untouched. This means that any existing configuration file (`CONFIG.NXD`) or IP address file (`NWID.NXD`) in the device can be preserved for further use, if needed. However, if you want a “complete recovery” of your device via USB (a complete recovery of the “factory settings” means that only “fresh” firmware is present in the device), you can delete these configuration files separately in the **Explorer** of the **ComProX** tool.
After having downloaded the new firmware via USB, you can of course, as an alternative, also delete the old configuration files by connecting to the Web Configuration Interface of the netSCADA device via Ethernet and then use the **Factory Restore** page to delete these files via HTTP (see section *Factory restore* [page 104]).

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Prerequisites

- The USB driver for the netSCADA device has been installed on the configuration PC
- The configuration PC is connected to the netSCADA device via USB cable
- netSCADA DVD
- netSCADA device is supplied with voltage

Step-by-step instructions

1. Open ComProX.
   - ➢ On the netSCADA DVD, open `Supplements & Examples\Device Recovery\NSCD-T52-RS_ATVISE_MBR Factory Reset USB` directory.
   - ➢ Double-click **comproX.exe** file.
   - ➢ The **ComProX** tool opens:

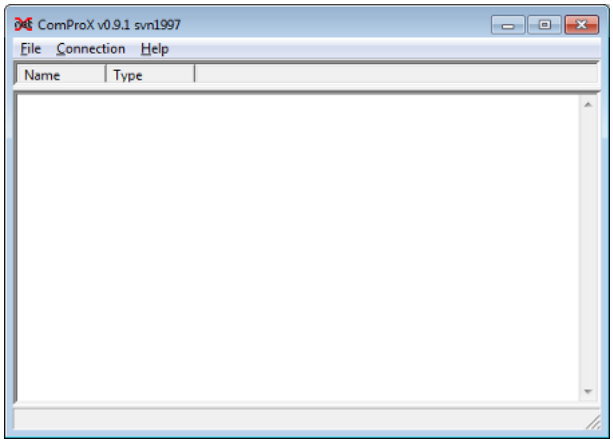

Figure 72: ComProX start screen

2. Connect to netSCADA device.
   - ➢ In the menu, choose **Connection** > **Open**.
   - ➢ After the Windows USB/COM ports have been scanned, the connection selection dialog opens:

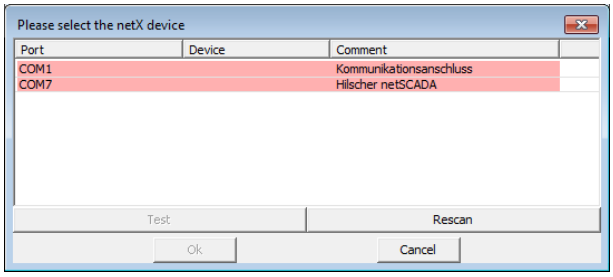

Figure 73: ComProX Connection Dialog

   - ➢ Select **Hilscher netSCADA** entry, then click **OK**.
   - ➢ The connection dialog closes and you are back in start screen of ComProX.

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3. Download firmware file.

➢ In the menu, choose **Connection** > **File Explorer**.

↬ The **Explorer** window opens:

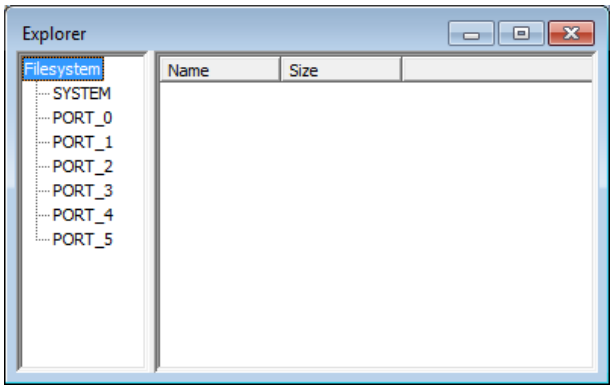

Figure 74: ComProX File Explorer

➢ Under **Filesystem**, select **PORT_0**.

↬ The contents of **PORT_0** is displayed. This, most likely, will be the old firmware file, which you want to overwrite, and the **INIBATCH.NXD** file.

➢ In the right part of the **Explorer** window, right-click to open the context menu, then choose **Download**.

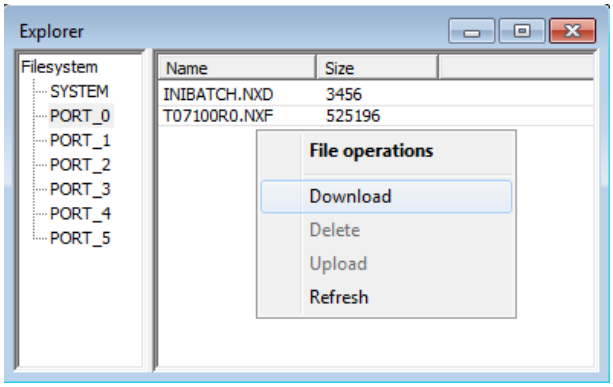

Figure 75: ComProX download

↬ The **Choose a file** dialog opens:

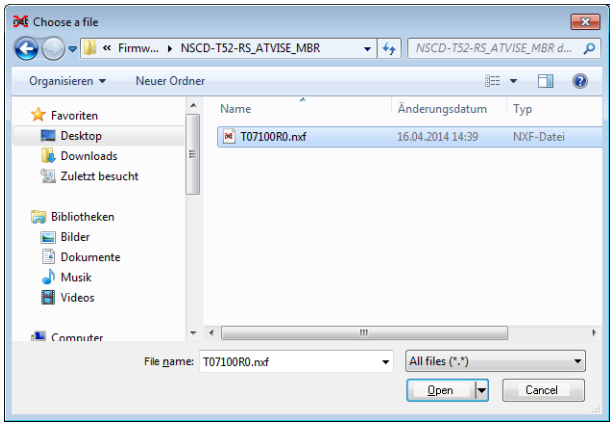

Figure 76: File selection dialog

➢ Select the firmware file `T07100R0`, which is the file you need to download to the netSCADA device.

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- ➢ Click **Open** button.
- ➢ The firmware file is being downloaded to the netSCADA device. The old firmware file is overwritten. This can take a few seconds.

4. Check download.
   - ➢ In the right part of the **Explorer** window, right-click to open the context menu, then choose **Refresh**.
   - ➢ Wait for a few seconds.
   - ➢ If the download has been successful, the downloaded firmware file is displayed in **Port_0.** The name of the new firmware file will be identical to the name of the old firmware file; however, by checking the different size of the file, you might be able to recognize that you have successfully loaded a new firmware version.

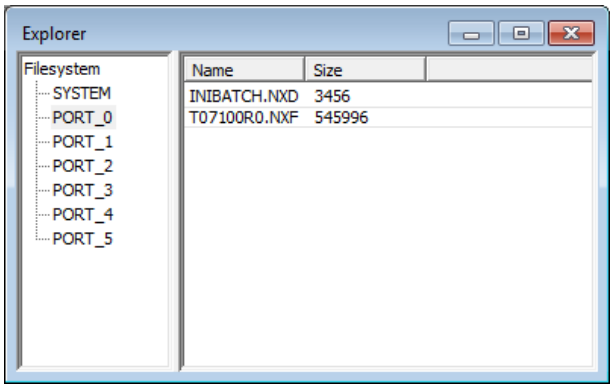

Figure 77: Downloaded firmware file in Explorer

Note:
If you want to perform a complete recovery of the “factory settings” of the device, you can now delete the configuration files stored in **Port_1**. To do so, select **Port_1** entry under **Filesystem** in the opened ComProX-**Explorer**, then select the file which you want to delete, then choose **Delete** from the context menu.

5. Exit ComProX.
   - ➢ Close the **Explorer** window.
   - ➢ In the menu of ComProX, choose **Connection** > **Close**, to close the connection to the device.
   - ➢ Close **ComProX**.
6. Restart netSCADA device.
   - ➢ Disconnect USB cable from the netSCADA device.
   - ➢ Reset the device to start the new firmware.

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11 General troubleshooting

General

Check if the following preconditions for netSCADA device operation are fulfilled:

- A suitable supply voltage must be available
  For **NL 50N-MPI-ATVISE**: internally from the S7 PLC or externally via 24V Mini COMBICON connector.
  For **NSCD-T52-RS/ATVISE/MBR**: via 24V Mini COMBICON connector.
- All software components must have been installed correctly.
- The configuration of the netSCADA devices must have been performed correctly.

Further information on this topic can be found in section *Requirements for operating the netSCADA devices* [page 19].

LNK-LED

The Ethernet link status LED (LNK) of the netSCADA device indicates whether a connection to the Ethernet exists. If the LED is off, no connection exists. If the LED is on, the device has a connection to the Ethernet.

ACT-LED

The Status LED ACT of the netSCADA device indicates whether communication takes place.

Cable

Make sure that the cable is connected to the hub/ switch on the Ethernet side and that the serial interface is connected to the S7 (**NL 50N-MPI-ATVISE**) respectively to the Modbus (**NSCD-T52-RS/ATVISE/MBR**).

Configuration

Check whether the IP address of the netSCADA device is configured according to the description given in section *Configuring permanent IP address (Network Settings)* [page 92].

Ethernet TCP/IP interface

Check the network settings of your PC.

With the ping command in MS-DOS Prompt, you can easily check if a connection via TCP/IP to the netSCADA device is possible. Open the MS-DOS Prompt and enter ping 192.168.10.190 (the IP address has to be the same as set in the netSCADA device) and press the Return key. Could a connection be established then the answer is displayed by the following text Reply from 192.168.10.190... Otherwise a connection timeout is displayed.

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12 LED descriptions

12.1 LEDs NL 50N-MPI-ATVISE

LED	Color	State	Meaning
SYS ①	**Duo LED yellow/green**		
	(green)	On	Firmware started.
	(yellow)	On	This state is allowed for a short time only. If this LED stays yellow, a hardware defect is possible.
	(yellow/green)	Blinking yellow/green	Bootloader active. This state is allowed for a short time only.
	(off)	Off	Missing power supply or a hardware error occurred.
COM ③	**Duo LED red/green**		
	(green)	On	Status The device currently holds the PROFIBUS token and is able to transfer telegrams of data.
	(green)	Blinking (regularly) 5 Hz	Status The device is configured to be a part of the PROFIBUS ring, but it must share the PROFIBUS token with other PROFIBUS-Master devices present on the PROFIBUS ring.
	(green)	Blinking (regularly) 0.5 Hz	Status Automatic baud rate detection is running.
	(red)	On	Error Communication error during execution of a PROFIBUS-MPI read or write access to S7. Possible reasons: S7 not reachable or S7 reports error for the last MPI read or write access. The error display is set back with the next error free MPI communication.
	(off)	Off	Status/Error The device has not been integrated into the PROFIBUS ring, i.e. it has not been configured correctly or has a wrong configuration or has not received the PROFIBUS token.
LNK ⑥	**LED green (next to RJ45 Ethernet socket)**		
	(green)	On	The device is currently connected to the Ethernet.
	(off)	Off	The device is currently not connected to the Ethernet.
ACT ⑦	**LED yellow (next to RJ45 Ethernet socket)**		
	(yellow)	On	The device currently sends or receives Ethernet-Frames.
	(off)	Off	The device does currently not send and receive any Ethernet-Frames.

Table 34: LEDs NL 50N-MPI-ATVISE

Positions ① … ⑦ refer to the figure in section *Overview connectors and LEDs NL 50N-MPI-ATVISE* [▷ page 22].

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12.2 LEDs NSCD-T52-RS/ATVISE/MBR

LED	Color	State	Meaning
SYSTEM ③	**System state – duo LED yellow/green**		
	(green)	On	Firmware started.
	(yellow)	On	This state is allowed for a short time only. If this LED stays yellow, a hardware defect is possible.
	(yellow/green)	Blinking yellow/ green	Bootloader active. This state is allowed for a short time only. If this state persists, the firmware file is corrupted or missing. In this case the firmware of the device needs to be recovered via USB connection. For details see *Firmware recovery of NSCD-T52-RS/ATVISE/MBR via USB* [page 106].
	(off)	Off	Missing power supply or a hardware error occurred.
CONFIG ③	**Configuration state – duo LED red/green**		
	(green)	On	Configuration of visualization is OK. Device has a valid atvise configuration. Access to visualization is possible.
	(green)	Blinking	Trend buffer is being formatted. This state occurs, when an atvise project featuring trend recording is being downloaded for the first time. The formatting process can take up to five minutes.
	(red)	On	Error in configuration of visualization. atvise configuration is missing or inconsistent. Access to visualization is not possible.
MODBUS ③	**Modbus state – duo LED red/green**		
	(green)	On	Device has a valid Modbus RTU configuration and is ready for Modbus communication, respectively sends/receives Modbus RTU telegrams.
	(red)	On	Communication error. If device is configured as **Modbus RTU Master**: • the slave device answered with an error (Modbus Exception), e. g. function code not supported, access to invalid register addresses or coil addresses • receive error detected, e. g. parity error or checksum error • timeout (slave device does not answer) If device is configured as **Modbus RTU Slave**: • the Modbus RTU Master device uses an invalid function code • the Modbus RTU Master device has accessed invalid register addresses or coil addresses • receive error detected, e. g. parity error or checksum error • timeout (application does not answer or answers with error) **Note**: The error display will be set back with the next error-free Modbus telegram sequence
ACTIVE ③	**Visualization state – duo LED red/green**		
	(green)	On	Browser accesses visualization.
	(red)	On	Serious error in the visualization component of the firmware.
	(off)	Off	No active visualization connection.
LOAD ③	**File download state – duo LED red/green**		
	(green)	On	atvise configuration file is being downloaded.
	(red)	On	Error occurred during download of atvise configuration file.
	(off)	Off	No download activity.

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LED	Color	State	Meaning
LNK ⑦ and ⑩	**LED green (next to RJ45 Ethernet socket)**		
	(green)	On	The device is currently connected to the Ethernet.
	(off)	Off	The device is currently not connected to the Ethernet.
ACT ⑨ and ⑫	**LED yellow (next to RJ45 Ethernet socket)**		
	(gelb)	On	The device currently sends or receives Ethernet-Frames.
	(off)	Off	The device does currently not send and receive any Ethernet-Frames.

Table 35: LEDs NSCD-T52-RS/ATVISE/MBR

Positions ① … ⑫ refer to the figure in section *Overview connectors and LEDs NSCD-T52-RS/ATVISE/MBR* [page 23].

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13 Technical data

13.1 NL 50N-MPI-ATVISE

NL 50N-MPI-ATVISE	Parameter	Value
Processor	Type	netX 50
Memory	RAM	8 MB SDRAM
	FLASH	4 MB serial Flash, contains boot loader, firmware, configuration and visualization data.
	FLASH available for web application	ca. 3 MB
	RAM available for trend data	ca. 1 MB
SIMATIC S7 PLC	S7-300 with PROFIBUS or MPI interface	supported
	S7-400 with PROFIBUS or MPI interface	supported
	S7-200 with PROFIBUS or MPI interface	not supported
Interface for S7 – programming tool	Connector	D-Sub (9 pin, female connector) **Note**: There is a 1:1-connection to the corresponding pins of the PROFIBUS interface.
SIMATIC S7 data areas	Data blocks	Data blocks by import of the symbols from the S7 project file.
	Marker	Marker by manual adding of symbols.
	Maximum number of STEP 7 data points per display	64
PROFIBUS-MPI Communication	Type	Client
	Data transport	PROFIBUS-FDL telegrams
	Number of connections	Max. 32 MPI connections at the same time.
	Access to	Data block, Marker
PROFIBUS interface	Transmission rate	19.2 kBit/s to 1.5 MBit/s supported 31.25 kBit/s is not supported
	Interface type	RS-485, isolated
	Connector	D-Sub (9 pin, male connector)
	Automatic Baud rate detection (not at 187.5 kBit/s, 500 kBit/s, 1.5 MBit/s)	Supported for MPI. Not supported for PROFIBUS DP.
Max. linkable signals	Input signals	5760
	Input signals	5760
Ethernet communication	Data transport	TCP/IP
	Connections	Min. 3 TCP connections to browser at the same time possible.
Ethernet interface	Transmission rate	10/100 MBit/s
	Interface type	10 BASE-T/100 BASE-TX, isolated
	Connector	RJ45 socket
	Auto Negotiation	Supported
	Auto Crossover	Supported
Integrated Server/Clients	FTP server	RFC 959, Port 21, passive mode
	HTTP server	RFC 2616, Port 80, HTTP/1.1
	SNTP client	RFC 2030, Port 123, time synchronization

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NL 50N-MPI-ATVISE	Parameter	Value
Visualization	Web visualization	atvise webMI with Hilscher plug-ins
	Engineering tool	atvise builder by Certec
	Supported web browser	See section *Supported web browser* [page 118]
	Variables/data points	unlimited
	Web memory consumption	200 kByte per visualization page (typically)
	Standard functions	Alarm, Trend and user management
	Adaptability	Entirely customizable using Java scripting
	Multilingualism	Standard: german/english (can be extended)
Trending	Trend variables	Up to 32 Variables possible
	Sampling rate	200 ms to 24 hours
	Recording time	Depending on the number of variables and the sampling rate. Example: 8 Variables @ 60 sec. sampling rate = 11 days 18 Variables @ 60 min. sampling rate = 300 days
Real time	Real time clock	Software supported, precision: 50ppm
	Real time clock buffering	none
	Synchronization	Manually or cyclically by SNTP
LED indicators	LEDs	**SYS** System status **COM** Communication status **ACT** Ethernet activity status **LNK** Ethernet link status For details see section *LEDs NL 50N-MPI-ATVISE* [page 111]
Power supply	Voltage	18 – 30 V DC
	Typical current at 18 V	72 mA
	Typical current at 24 V	57 mA
	Typical current at 30 V	48 mA
	Connector for power supply from PLC	via D-Sub (9 pin, male connector) from PLC
	Connector for external power supply	Mini-COMBICON socket 3.81 mm, 2 pin
Electrical immunity to interference	Electrostatic discharge (ESD) according to IEC/EN 61000-4-2:1995	8 kV Air discharge, Criterion B 4 kV Contact discharge, Criterion B
	Fast transient interferences (Burst), zone B, according to IEC/EN 61000-4-4:1995	1 kV Ethernet Communication line, Criterion B
	Surge voltage, zone B, according to IEC/EN 61000-4-5:1995	1 kV CM, Ethernet Communication line, Criterion B
Environmental conditions	Temperature range	0 … + 50 °C
	Humidity range	0 … 85 % relative humidity (not condensing)
Device	Dimensions (L x W x H)	65 x 48 x 16 mm
	Weight	appr. 40 g
	Mounting/Installation	Directly at MPI interface of the SIMATIC S7 PLC
	Protection Class	IP20
	RoHS	Yes
CE Sign	CE Sign	Yes
	Emission	EN 55011:2009 + A1:2010, Class A
	Immunity	EN 61131-2:2008

Table 36: Technical Data NL 50N-MPI-ATVISE

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13.2 NSCD-T52-RS/ATVISE/MBR

NSCD-T52-RS/ATVISE/MBR	Parameter	Value
Processor	Type	netX 52
Memory	RAM	8 MB SDRAM
	Web application memory	6 MB non-volatile FLASH memory
	Trending memory	8 MB non-volatile FLASH memory
Modbus RTU communication	Type	Slave or master to 16 slaves
	Modbus interface	RS-232 RS-485 RS-422 **NOTICE** **Device damage by compensating current** ! The reference potential of the power supply and the reference potential of the RS-232/RS-422/ RS-485 interface are galvanically connected. Avoid compensating currents between the reference potentials of the devices connected via RS-232/RS-422/RS-485.
	Modbus connector	COMBICON MSTB 2.5/5 5 pins, green
	Baud rate	1.2 kBaud…115.2 kBaud
	Function codes	FC1, FC2, FC3, FC4, FC5, FC15, FC16
Ethernet communication	Data transport	TCP/IP
	Connections	Min. 3 TCP connections to browser at the same time possible
Ethernet interface	Interface type	10 BASE-T/100 BASE-TX, isolated
	Transmission rate	10/100 MBit/s
	Connector	2 x RJ45 sockets with integrated switch
	Auto Negotiation	Supported
	Auto Crossover	Supported
Integrated Server/Clients	FTP server	RFC 959, Port 21, passive mode
	HTTP server	RFC 2616, Port 80, HTTP/1.1
	SNTP client	RFC 2030, Port 123, time synchronization
Visualization	Web visualization	atvise webMI with Hilscher plug-ins
	Engineering tool	atvise builder by Certec
	Supported web browser	See section *Supported web browser* [page 118]
	Variables/data points	unlimited
	Web memory consumption	200 kByte per visualization page (typically)
	Standard functions	Alarm, trend and user management
	Adaptability	Entirely customizable using Java scripting
	Multilingualism	Standard: german/english (can be extended)
Trending	Trend variables	Up to 32 variables possible
	Sampling rate	200 ms to 24 hours
	Recording time	Depending on the number of variables and the sampling rate. Example: 8 Variables @ 60 sec. sampling rate = 45 days 18 Variables @ 60 min. sampling rate = 1200 days
Real time	Real time clock	Hardware supported, precision: 20ppm
	Real time clock buffering	Min. 7 days, maintenance-free by SuperCap
	Synchronization	Manually or cyclically by SNTP

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NSCD-T52-RS/ATVISE/MBR	Parameter	Value
LED indicators	LEDs	**SYSTEM** System status **CONFIG** Configuration status **MODBUS** Modbus status **ACTIVE** Visualization status **LOAD** File download status **ACT** Ethernet activity status **LNK** Ethernet link status For details see section *LEDs NSCD-T52-RS/ ATVISE/MBR* [page 112]
Power supply	Voltage	18 – 30 V DC
	Typical current at 18 V	120 mA
	Typical current at 24 V	88 mA
	Typical current at 30 V	73 mA
	Connector	COMBICON MC 1.5/5 5 pins
Electrical immunity to interference	Electrostatic discharge (ESD) according to IEC/EN 61000-4-2:2008	8 kV Air discharge, Criterion B 4 kV Contact discharge, Criterion B
	Fast transient interferences (Burst), zone B, according to IEC/EN 61000-4-4:2004 +Cor.1:2006 +Cor.2:2007 +A1:2010	2 kV Power supply connector DC, Criterion B 1 kV Communication lines Ethernet and RS, Criterion B
	Surge voltage, zone B, according to IEC/EN 61000-4-5:2005	0.5 kV CM/DM Power supply connector DC, Criterion B 1 kV CM Communication lines Ethernet and RS, Criterion B
Environmental conditions	Temperature range	0 … + 50 °C
	Humidity range	10 … 95 % relative humidity (not condensing)
Device	Dimensions (L x W x H)	88 x 22,5 x 78 mm
	Weight	ca. 84 g
	Mounting/Installation	Top hat rail mounting according to DIN EN 60715
	Protection Class	IP20
	RoHS	Yes
CE Zeichen	CE Sign	Yes
	Emission	EN 55011:2009 + A1:2010, Class A
	Immunity	EN 61131-2:2008

Table 37: Technical data NSCD-T52-RS/ATVISE/MBR

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13.3 Integrated WebServer

Technical data of the servX HTTP server version V1.1.0 (WebServer integrated in the netSCADA devices)

Parameter	Value
Supported protocol	HTTP/1.1 - Hypertext Transfer Protocol (RFC 2616)
Max. number of connections	16
Supported HTTP methods:	GET
	HEAD
	POST
atvise webMI standard	Supported
Request URI to file system mapping	Supported
Media type recognition from filename suffix	Supported
Server Side Includes (SSI)	Supported
Chunked Transfer Encoding	Not supported

Table 38: Technical data of the integrated WebServer

13.4 Real time clock

Device	Type	Precision	Power failure-safe	Buffering	Synchronization
NL 50N-MPI-ATVISE	Software supported	50ppm	No	No	Manually or cyclically by SNTP
NSCD-T52-RS/ ATVISE/MBR	Hardware supported	20ppm	Yes	Min. 7 days, maintenance-free by SuperCap	

Table 39: Technical data real time clock

13.5 Supported web browser

Web browser supported by atvise with min. 3 simultaneously active connections:

Browser	Version
Microsoft Internet Explorer	8 (with VML conversion), 9 and 10
Mozilla Firefox	24
Apple Safari	5.1.7
Google Chrome	31
Opera	16
Blackberry	6 or 10

Table 40: Web browser supported by atvise

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14 Disposal of waste electronic equipment

According to the European Directive 2002/96/EG “Waste Electrical and Electronic Equipment (WEEE)”, waste electronic equipment may not be disposed of as household waste. As a consumer, you are legally obliged to dispose of all waste electronic equipment according to national and local regulations.

Waste electronic equipment

This product must not be treated as household waste.

This product must be disposed of at a designated waste electronic equipment collecting point.

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15 Glossary

10-Base T	Standard for communication on Ethernet over twisted pair lines with RJ45 connectors and a baud rate of 10 MBit/s (according to the IEEE 802.3 specification).
100-Base TX	Standard for communication on Ethernet over unshielded twisted pair lines with RJ45 connectors and a baud rate of 100 MBit/s according to the IEEE 802 specification.
atvise	Package from the Austrian company Certec EDV GmbH (Thomas-Alva-Edisonstrasse 1, A-7000 Eisenstadt, Austria, www.atvise.com). The most important part of atvise is the atvise builder, which is delivered with the netSCADA device.
atvise builder	atvise builder is a software tool from the Austrian company Certec EDV GmbH (Thomas-Alva-Edisonstrasse 1, A-7000 Eisenstadt, Austria, www.atvise.com which can be used to design web interfaces and create visualizations for devices in automation such as the netSCADA.
atvise server	atvise server is a component of the atvise software package. It runs permanently on the PC and can be accessed via its icon in the icon tray. If the icon is green, the server is running.
atvise webMI	atvise webMI is a set of rules with which Web servers must comply if they are used in conjunction with the atvise builder.
Auto-Crossover	Auto-Crossover is a feature of an interface: An interface with Auto-Crossover capability will automatically detect and correct if the data lines have been exchanged vice versa.
Auto-Negotiation	Auto-Negotiation is a feature of an interface: An interface with Auto- Negotiation will automatically determine a set of correct communication parameters.
Baud rate	Data transmission speed of a communication channel or interface.
Boot loader	Program loading the firmware into the memory of a device in order to be executed.
DHCP	Dynamic Host Configuration Protocol. This is a protocol simplifying the configuration of IP networks by automatically assigning IP addresses.
DHCP server	A DHCP server assigns the IP addresses to the other devices within the respective IP network.
Ethernet	A networking technology used both for office and industrial communication via electrical or optical connections. It has been developed and specified by the Intel, DEC and XEROX. It provides data transmission with collision control and allows various protocols. As Ethernet is not necessarily capable for real-time application, various real-time extensions have been developed.
Firmware	Software running inside a device providing the basic functionality of this device. The firmware is stored remanent in the flash memory circuit of the device. It can be updated by a firmware download.
Firmware update	Loading the firmware from an external storage to the flash memory circuit of the device.
Flash memory	A special kind of remanent (non-volatile) electronic memory circuits.
FTP	A networking protocol for file transmission defined by the IETF Network Working Group in RFC959.
FTP server	A software providing files to other software on other computers in the network (for instance, in the Internet) requesting these files. The software requesting files is called FTP client.
Gateway	A device interfacing between two different communication standards. The netLINK SCADA device is a gateway between the communication standards MPI and Ethernet, the netSCADA Modbus device is a gateway between Modbus RTU and Ethernet.
HTTP	Hypertext Transfer Protocol. This is a protocol for transmission of web pages (HTML documents). It is defined by the IETF Network Working Group in RFC 2616.
HTTP server	A software providing web contents (HTML documents, graphics, JavaScript contents) on request via HTTP.
Hub	A network component connecting multiple communication partners with each other. A hub does not provide own intelligence, thus it does not analyze the data traffic and sends received data to all connected communication partners. A hub can be used for setting up a star topology.
IP address	Address within IP (the Internet Protocol, part of TCP/IP). An IP address consists of 4 decimal values. Each of these must be in the range between 0 and 255. In the usual representation, these 4 decimal values are separated by points.
Javascript	A programming language for creating dynamic and interactive web contents.

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LAN Scanner and Configuration Tool	The Ethernet Device Configuration Tool allows users to temporarily adjust the IP address of netX-based devices in TCP/IP networks. It is an easy to use configuration tool for the installation and configuration of the netSCADA device.
MPI	Multi Point Interface The MPI is a proprietary interface of the SIMATIC S7 series of PLCs. It is compatible to PROFIBUS and based on RS-485. It usually works with a transmission rate of 187.5 kBaud.
netX	networX on chip, next generation of communication controllers.
Non-volatile	See **Remanent**.
PLC	Programmable Logic Controller A digitally programmed device for controlling a machine or facility.
Remanent	Remanent memory holds its data even after power-off, for instance flash memory is remanent. It is also called non-volatile memory.
RJ45	A connector type often used for Ethernet connection. It has been standardized by the Federal Communications Commission of the USA (FCC).
RoHS	Restriction of Hazardous Substances This abbreviation denominates the directive of the European Union on the use of 6 hazardous substances in electronic products. It is titled *"Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment2002/95/EC",* adopted in 2003 and was getting effective on 1 July 2006.
SCADA	Supervisory Control and Data Acquisition A concept for control and data acquisition of technical processes.
STEP 7	Programming language for the SIMATIC S7 Series of PLCs.
SVG	Scalable Vector Graphics SVG is a standard for freely scalable vector graphics based on XML which has been published by the World Wide Web Consortium (W3C). It defines a description language for graphical and multimedia objects allowing you to create high-quality graphical output in any size easily. It is ideally suited to create GUIs for human-machine interfaces.
Switch	A network component connecting multiple communication partners (or even entire branches of a network) with each other. A switch is an intelligent network component which analyzes network traffic in order to decide on its own. For the connected communication partners a switch behaves transparently.
Symbolizer	A tool written and supplied by Hilscher to be used to extract symbolic information from STEP 7 project filers used in SIMATIC S7 PLCs and analyze this information for connecting it to graphical displays in a GUI.

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Contacts

HEADQUARTERS

Germany

Hilscher Gesellschaft für
Systemautomation mbH
Rheinstrasse 15
D-65795 Hattersheim
Phone: +49 (0) 6190 9907-0
Fax: +49 (0) 6190 9907-50
E-Mail: info@hilscher.com

Support

Phone: +49 (0) 6190 9907-99
E-Mail: de.support@hilscher.com

SUBSIDIARIES

China

Hilscher Systemautomation (Shanghai) Co. Ltd.
200010 Shanghai
Phone: +86 (0) 21-6355-5161
E-Mail: info@hilscher.cn

Support

Phone: +86 (0) 21-6355-5161
E-Mail: cn.support@hilscher.com

France

Hilscher France S.a.r.l.
69500 Bron
Phone: +33 (0) 4 72 37 98 40
E-Mail: info@hilscher.fr

Support

Phone: +33 (0) 4 72 37 98 40
E-Mail: fr.support@hilscher.com

India

Hilscher India Pvt. Ltd.
Pune, Delhi, Mumbai
Phone: +91 8888 750 777
E-Mail: info@hilscher.in

Italy

Hilscher Italia S.r.l.
20090 Vimodrone (MI)
Phone: +39 02 25007068
E-Mail: info@hilscher.it

Support

Phone: +39 02 25007068
E-Mail: it.support@hilscher.com

Japan

Hilscher Japan KK
Tokyo, 160-0022
Phone: +81 (0) 3-5362-0521
E-Mail: info@hilscher.jp

Support

Phone: +81 (0) 3-5362-0521
E-Mail: jp.support@hilscher.com

Korea

Hilscher Korea Inc.
Seongnam, Gyeonggi, 463-400
Phone: +82 (0) 31-789-3715
E-Mail: info@hilscher.kr

Switzerland

Hilscher Swiss GmbH
4500 Solothurn
Phone: +41 (0) 32 623 6633
E-Mail: info@hilscher.ch

Support

Phone: +49 (0) 6190 9907-99
E-Mail: ch.support@hilscher.com

USA

Hilscher North America, Inc.
Lisle, IL 60532
Phone: +1 630-505-5301
E-Mail: info@hilscher.us

Support

Phone: +1 630-505-5301
E-Mail: us.support@hilscher.com

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